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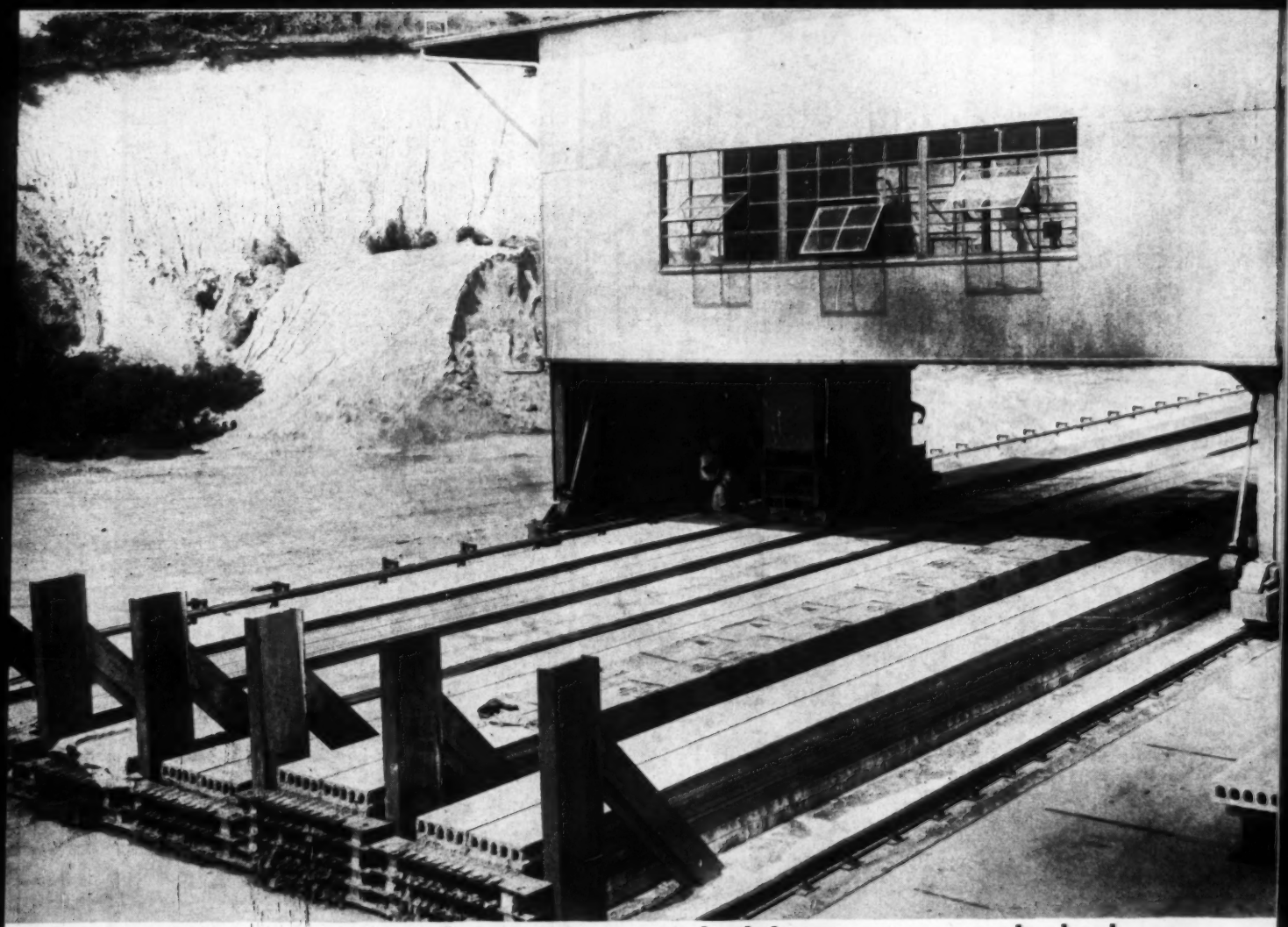

Concrete extruded for prestressed plank p. 40

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Architect: Port of New York Authority; *General Contractor:* S. S. Silberblatt

Bolted Joints Used in Steel Frame for New Hangar at Idlewild

These trusses are part of the steel framework for the enormous new Hangar 8 at New York International Airport, Idlewild. The hangar, about 440 ft, in length was constructed by The Port of New York Authority to house airplanes of the United Airlines fleet.

The structure has a 99-ft-wide service core along its entire length. Roof trusses spanning this core are cantilevered 133 ft out on either side, forming two bays measuring 440 x 133 ft. Because of the ease of access desired, exterior structure supports were prohibited. The steel framework for the hangar was bolted, Bethlehem High-Strength Bolts being used for all of the main connections.

Bethlehem High-Strength Bolts are ideal for joining structural members because they retain their full clamping force, thus providing permanently tight joints. They can be installed quickly, with minimum noise. And being placed cold, they do not present a fire hazard.

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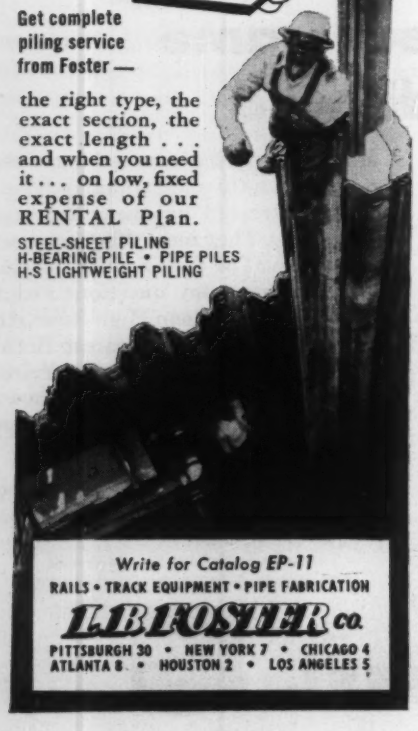

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CONTENTS ON PAGE 17

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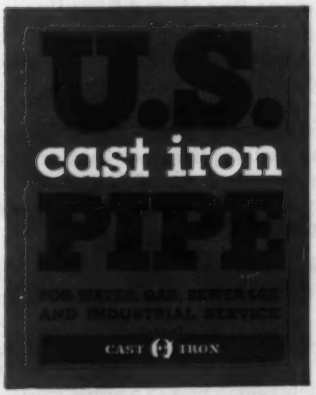

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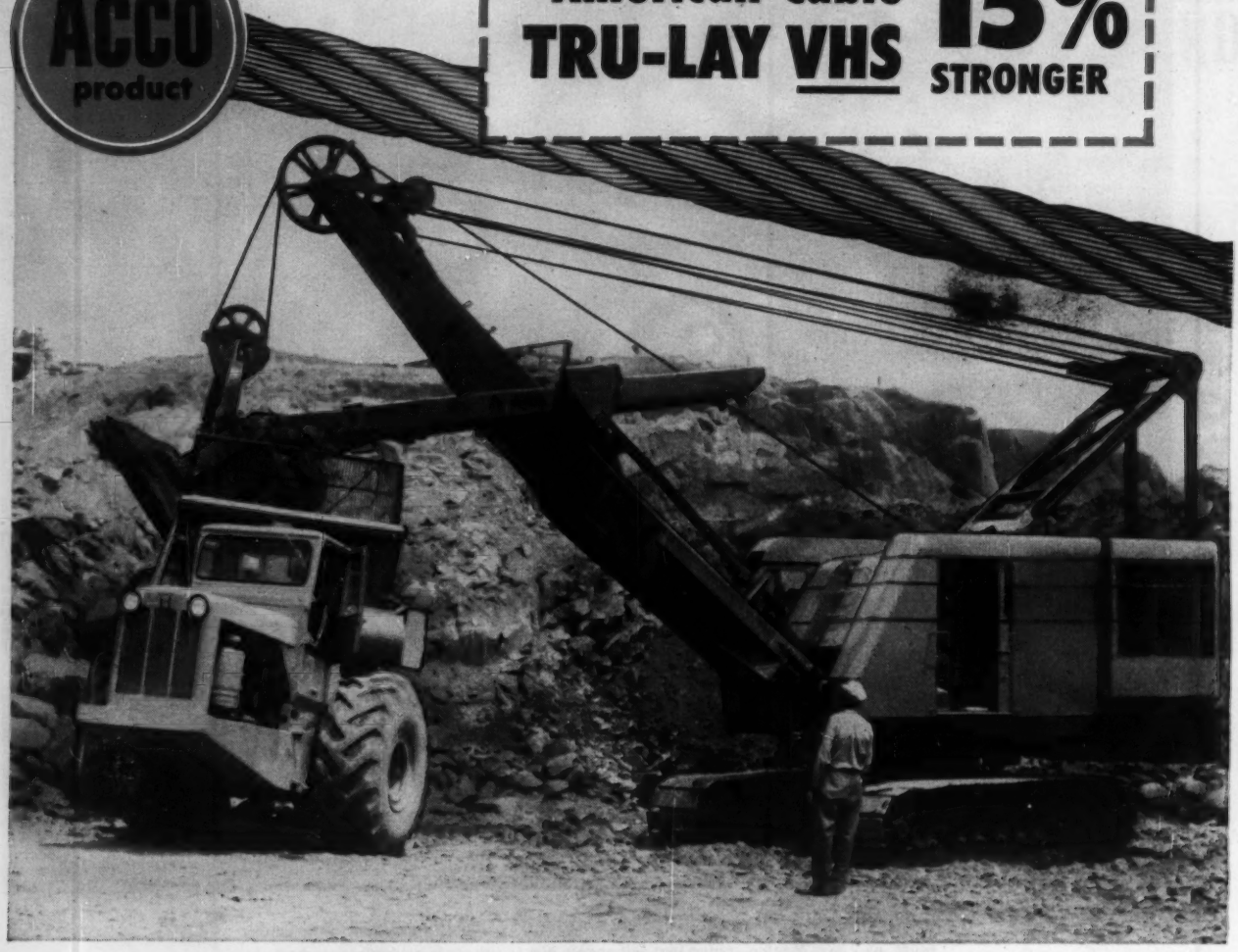

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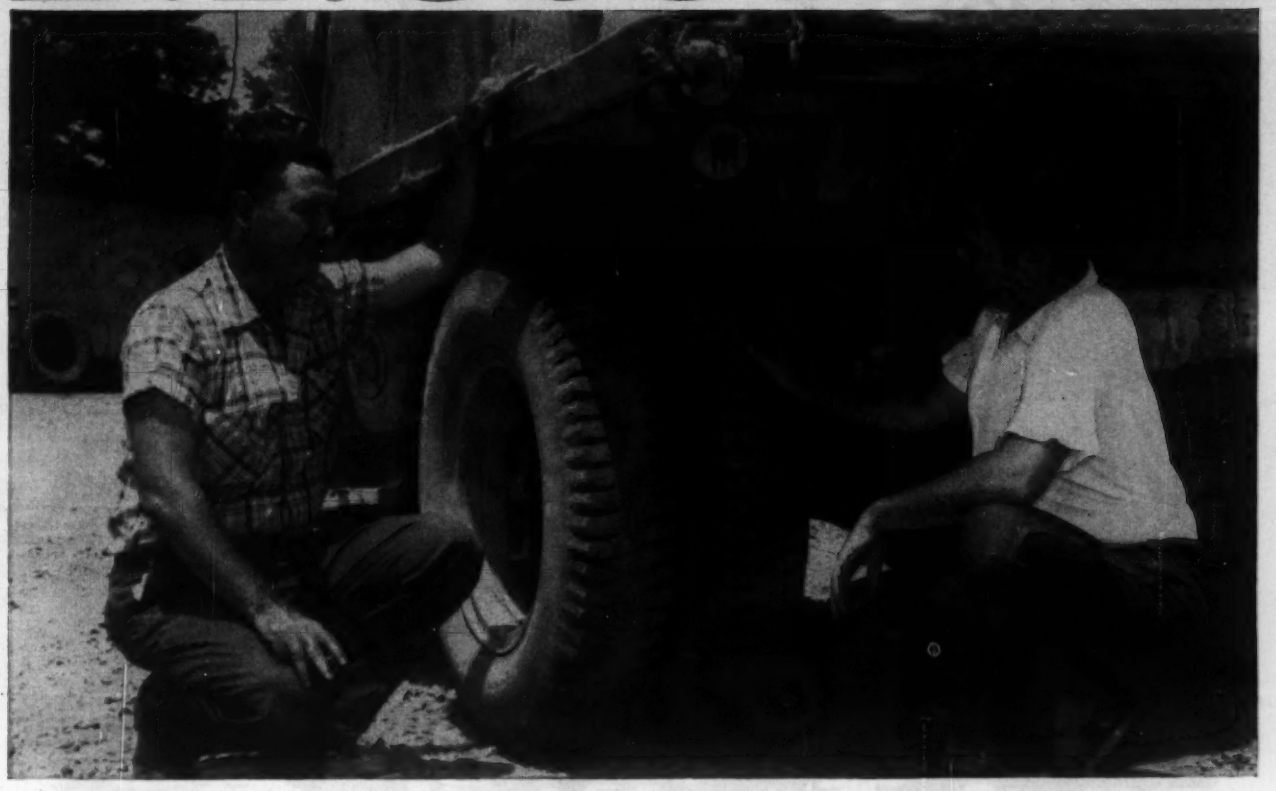

Switches to All-Nylon All-Purpose tires, reports "we really get our money's worth"

Two years ago Jernigan Trucking Company trucks were hauling stone to bridge approaches in the Clark Hill Dam area, northwest of Martinez, Georgia. Giant loads had to be carried over rough, back-country roads. The company found that even brand new tires were ruined in a month or less by concussion blowouts and cord failures. Schedule delays cost the company even more money.

Then Jernigan switched to new B. F. Goodrich All-Purpose tires with *all-nylon* construction. The result: no more blowouts; the tires have traveled over 50,000 miles, will be good for another 25,000 before recapping. No wonder Office Manager H. B. Leonard says, "We find the best tire is the cheapest in the long run, and we get every dollar's worth out of B. F. Goodrich All-Purpose tires."

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See your B. F. Goodrich retailer today and save money on tires. Or write *The B. F. Goodrich Company, Tire & Equipment Division, Akron 18, Ohio.*

JERNIGAN'S 17 trucks carry loads up to 20 tons to construction sites around Martinez, Ga., work on and off the road.

NORTHWEST CONSTRUCTION CO., Seattle, Wash., reports B. F. Goodrich Rock Logger tires give 60,000 miles plus 2 recaps!

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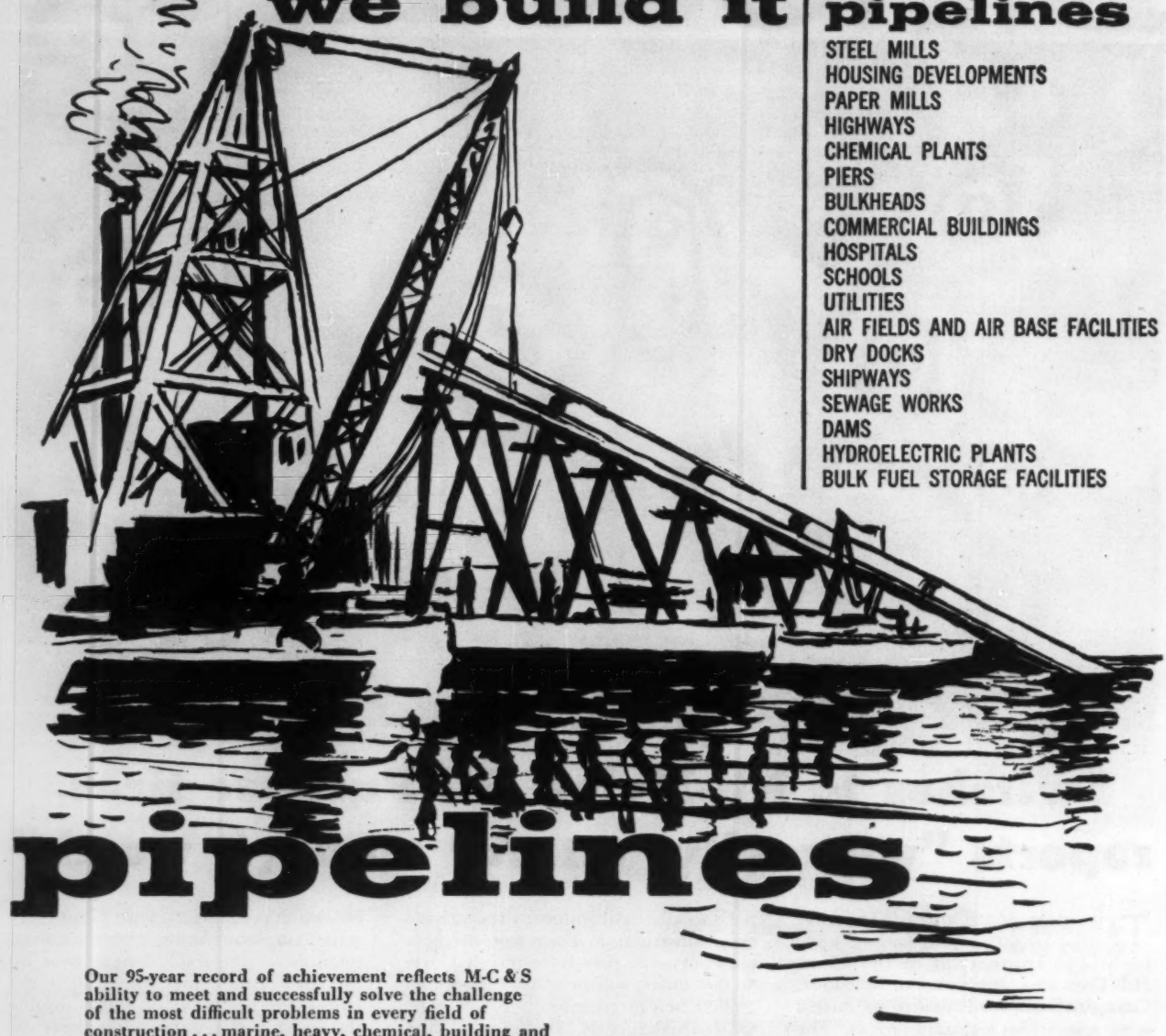

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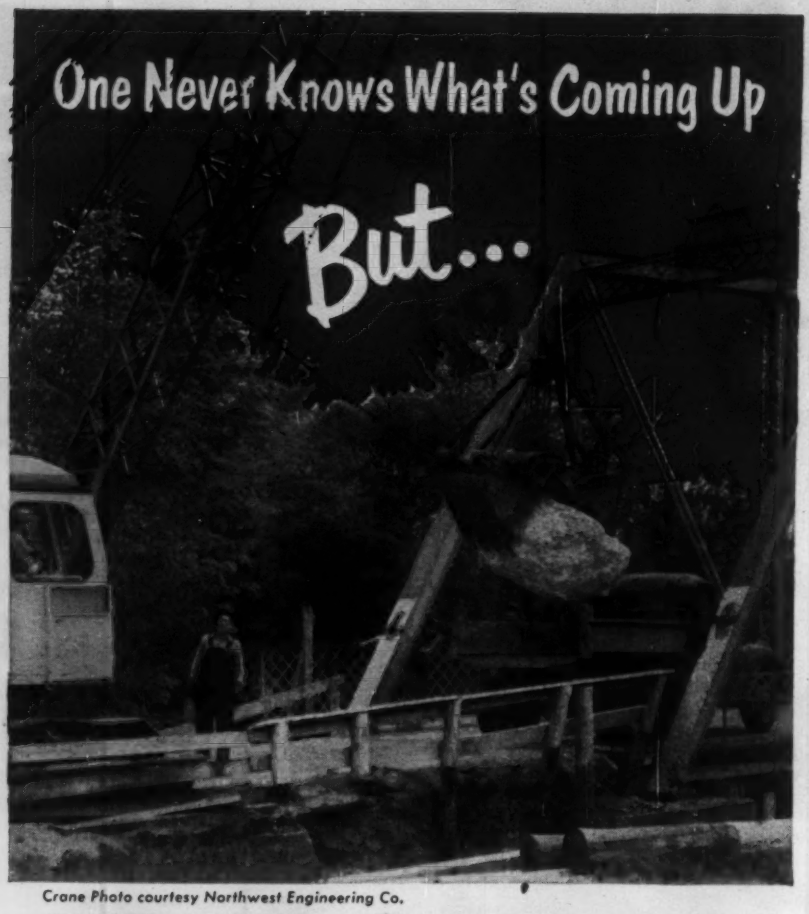

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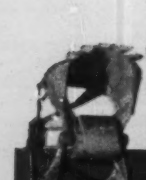

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READER COMMENT

Why Blame the Inspector?

SIR—I read with extreme interest in ENR May 12 and 19 and July 14 the articles dealing with the formwork failure on the New York Coliseum project. Invariably when disasters such as this occur the first one to be taken to task is the construction inspector. It was determined by the district attorney's findings that, among other things, all construction inspectors should be engineers.

Sure! We'd have had better pyramids if the sweating slaves had carried sheepskins! Think of the upped cost of inspection we'd be suddenly faced with in a construction program already bereft of good engineers!

We've got good inspectors now! Just give them the authority they should have. Let them use their years of irreplaceable experience and stand back and watch them do away with some of the shoddy practices that are allowed to go on because some engineer who isn't dry back of the ears desires not "to persecute some recalcitrant contractor."

Among the many hundreds of highly skilled and thoroughly trained men employed as construction inspectors, every now and then we do run across some individual who doesn't know a "She-Bolt" from a shovel handle! Such inspectors should be discharged with celerity for the betterment of the whole industry.

It was intimated that perhaps the job inspector in this instance was overloaded with work assignments, and had not been able to give any one job the proper attention it deserved. Why? Let's arrange our inspection programs efficiently, so that proper coverage is not only possible but guaranteed.

Why for instance, if the formwork was improperly erected and designed, did not some engineer have enough interest in the project to catch the errors, rather than blame it on the inspector? Why was no previous legislation passed to control the speed

(*Continued on page 12*)

Engineering News-Record welcomes expression of opinion from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance.

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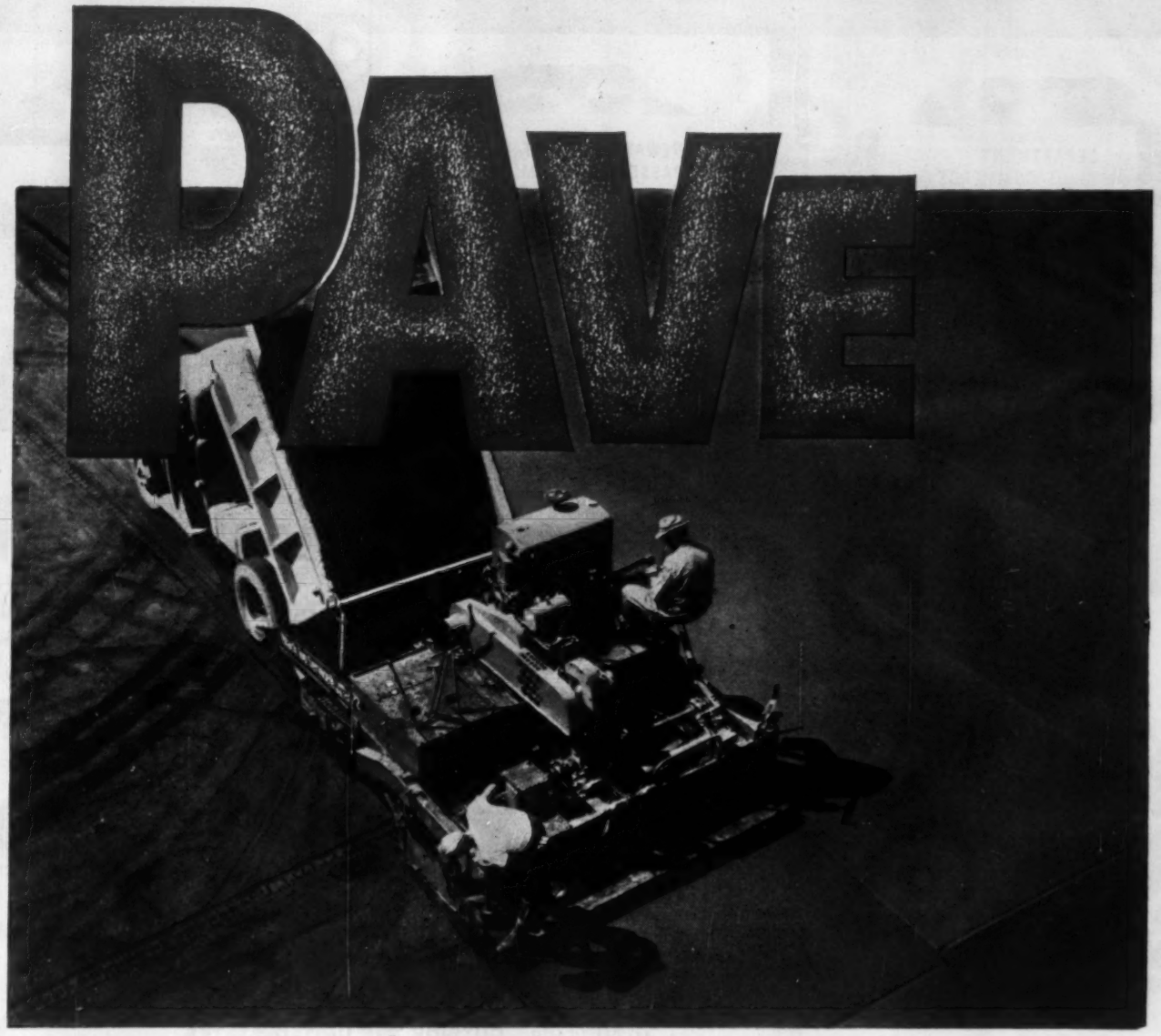

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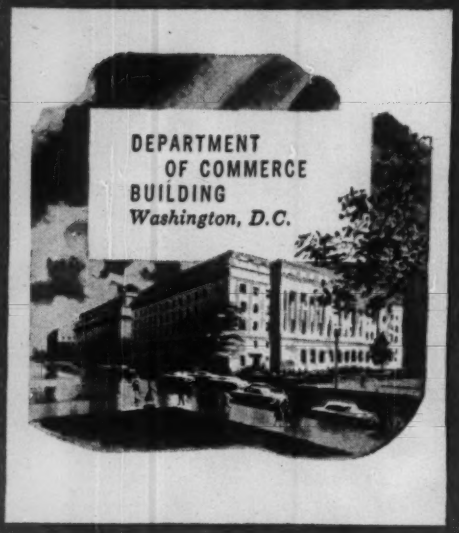

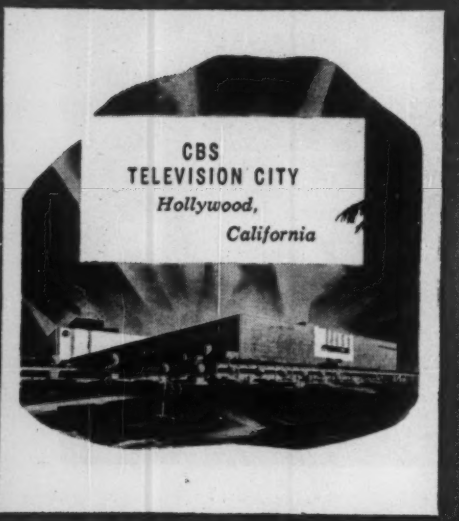

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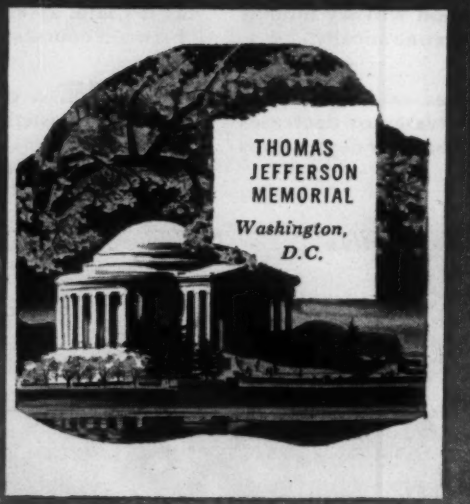

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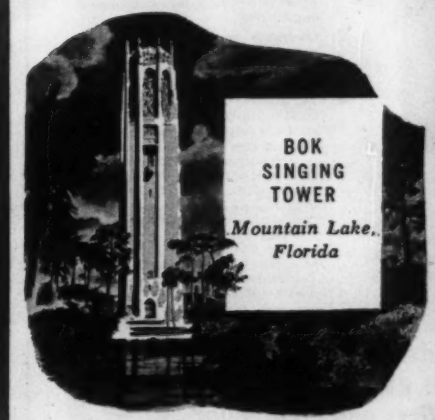
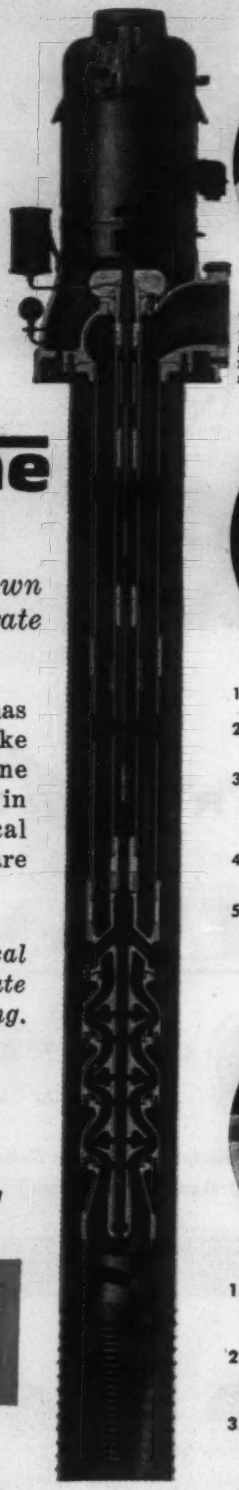
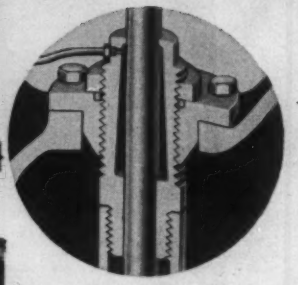






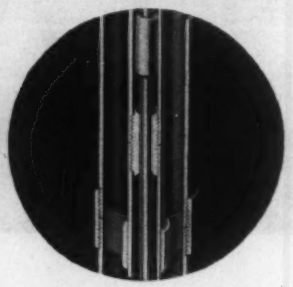
This easily accessible assembly provides means of putting tension on oil tubing, making a rigid, taut, non-vibrating bearing and shaft enclosure.

Verti-Line PUMPS

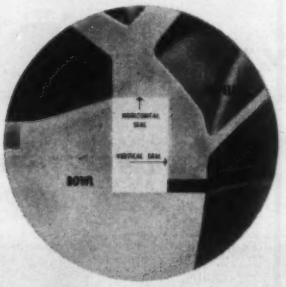
are economical to own — economical to operate

Feature after feature has been designed to make the Verti-Line Turbine Pump today's best buy in vertical pumps. Typical construction features are illustrated.

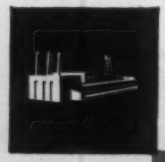
Whatever your vertical pump needs, investigate Verti-Line before buying.



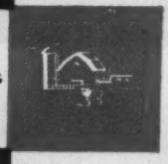
1. Butt-joint column pipe is usually furnished in 10 ft. lengths.
2. Sleeve type pipe couplings are standard. Flanged type also available.
3. Reinforced rubber enclosing tube supports assure alignment of oil tube and are spaced as specified by Layne & Bowler engineers.
4. Extra long, special alloy bronze bearings are spaced at 5 ft. intervals.
5. Lineshaft is of highest quality steel, turned, ground and polished. Tested for accuracy within .002 in. High tensile strength assures greater safety.



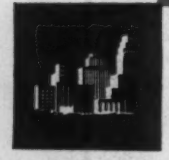
1. Either radial vane or mixed flow type impellers are supplied depending on service and conditions.
2. Oversize pump shafts eliminate deflection, whip and vibration, resulting in longer bowl life.
3. Perihedral seal combines vertical cylindrical and horizontal surface impeller sealing. Shaft stretch due to pressure change is not critical, because of vertical cylindrical seal. However, adjustment for wear to restore original capacity is easily accomplished by means of an adjusting nut in the top of the driver that brings into action the horizontal part of the Perihedral seal — an exclusive Verti-Line feature.



in all industry



on the farm



for the city

Send for your free copy of our new booklet, "Pumps For Sale." Ask for Bulletin E-115

Verti-Line Pumps are the exclusive products of

LAYNE & BOWLER PUMP COMPANY

general offices and main plant

2943 VAIL AVENUE • LOS ANGELES 22, CALIFORNIA

READER COMMENT

of the concrete buggies being used?

No amount of pity and head-shaking will bring back the human life lost in this fiasco, but certainly we must bolster up the type of men we have in charge of similar projects from the engineer down. We are a team. When one fails, it is due to a definite shortcoming. There is no need to whitewash a catastrophe with "trumped-up" theories as to how it happened! The truth is, that sooner or later the facts will come out. What we must be mainly interested in now is:

- Proper engineering practices.
- Improvement in the system of turning out engineers.
- Enforcement of safety rules even if it meets violent contractor objection (and the chances are the contractor will favor same, rather than oppose it).
- Equitable coverage of all such projects with construction inspectors equipped with years of valuable know-how and devoted to the cause of sound construction based upon good engineering planning.

FRED L. POPE
Supervisory Construction Inspector
United States Navy
San Diego, Calif.

CALENDAR

Conference on Doorways to Progress in Building, sponsored by Armour Research Foundation of the Illinois Institute of Technology, Illinois Institute of Technology campus, Chicago, Ill., Dec. 1.

American Association of State Highway Officials, annual meeting, Jung Hotel, New Orleans, La., Dec. 4-9.

Nuclear Engineering and Science Congress, sponsored by the Engineers Joint Council, Public Auditorium, Cleveland, O., Dec. 12-16.

American Road Builders' Association, annual convention, Miami Beach Auditorium, Miami Beach, Fla., Jan. 11-14.

Highway Research Board, annual meeting, Sheraton-Park Hotel, Washington, D. C., Jan. 17-20.

American Society of Heating and Air-Conditioning Engineers, annual meeting, Sheraton-Gibson Hotel, Cincinnati, O., Jan. 23-25.

National Association of Home Builders, annual convention-exposition, Conrad Hilton and Sherman Hotels, and the Coliseum, Chicago, Ill., Jan. 22-26.

Associated Equipment Distributors, annual meeting, Conrad Hilton Hotel, Chicago, Ill., Jan. 29-Feb. 2.

Society of American Military Engineers, annual technical meeting, Palmer House, Chicago, Ill., Feb. 9-10.

Association of Asphalt Paving Technologists, annual meeting, Hotel Cleveland, Cleveland, O., Feb. 13-15.

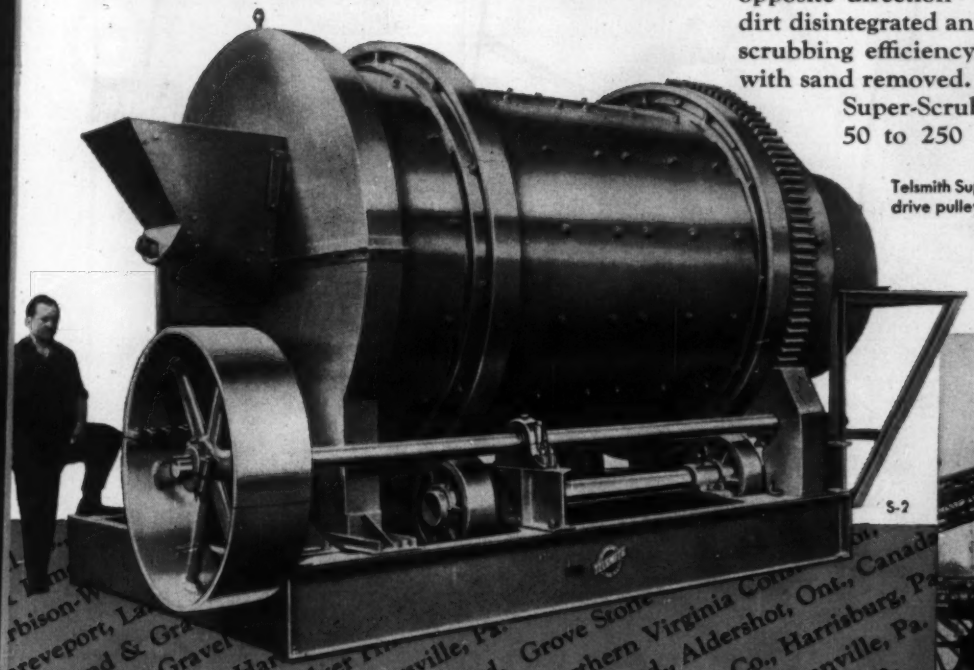
Associated General Contractors of America, national convention, Waldorf-Astoria Hotel, New York, N. Y., Feb. 13-16.

FOR CLEAN AGGREGATE—HIGH CAPACITY

TELSMITH

Super-Scrubbers®

● **Most of the better sand and gravel pits are exhausted**—those now in use contain more clay, which must be eliminated. Many states now require that crushed stone be scrubbed before screening to eliminate soft stone, clay and dirt. This demands a better scrubber—one which will eliminate large amounts of clay with a minimum of expense for installation, water, power and upkeep. Telsmith's answer—the Super-Scrubber. **Outstanding features: high speed, terrific impact and grinding action,** much like a ball mill. Aggregate travels from feed to discharge end against clean water flowing in the opposite direction — emerges clean — with clay and dirt disintegrated and carried away by the water. Top scrubbing efficiency on coarse aggregate is obtained with sand removed. **A proven success**—the Telsmith Super-Scrubber made in 4 sizes: 60" to 96", 50 to 250 tons hourly. Get Bulletin 266.



Telsmith Super-Scrubber complete on steel frame with flat belt drive pulley. Can be furnished with enclosed, silent-chain drive.

Three of the five 60-inch diameter Telsmith Super-Scrubbers in Colonial Sand & Stone Co., Inc. plant, Port Washington, New York.

S-2

Valley Mould & Iron Co., Cleveland, Ohio Pennsylvania Supply Co., Harrisburg, Pa.
Amico Sand & Gravel Co., Morrisville, Pa. Fiala Crushed Stone Corp., Annville, Pa.
Fenton Construction Co., Ashland, Ohio Banks Stone & Sand Co., Kingston, Pa.
Colonial Sand & Stone Co., Inc., Port Washington, N. Y. Fenton Construction Co.
Grove Stone & Sand Co., Swannonoa, N. Carolina Drake-Winkelman, Cuba
New Enterprise Stone & Lime Co., New Enterprise, Pa. Rogers Construction Co.
Northern Virginia Construction Co., Alexandria, Va. Sharon Silica Co., Jackson, La.
Rogers Construction Co., Portland, Ore. Meriwether Supply Co., Shreveport, La.
Contee Sand & Gravel Co., Fairland, Md. Sheffield Steel Co., Linden, Texas
Dutchess Quarry & Supply Co., Poughkeepsie, N. Y. Contee Sand & Gravel Co.
Contee Sand & Gravel Co., Laurel, Md. Miami Gravel Co., Rittenours, Ohio
Prince George Sand & Gravel Co., Laurel, Md. Buffalo Sand & Gravel Co.
Kilbuck Sand & Gravel Co., Brinkhaven, Ohio Colonial Sand & Gravel Co.
Harbison-Walker Refractories, Garrettsville, Ohio Davis Sand & Gravel Co.
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Davis Sand & Gravel Co., Clinton, Md. Kilbuck Sand & Gravel Co.
Sharon Silica Co., Jackson, Ohio J. Cooke, Ltd., Aldershot, Ont., Canada
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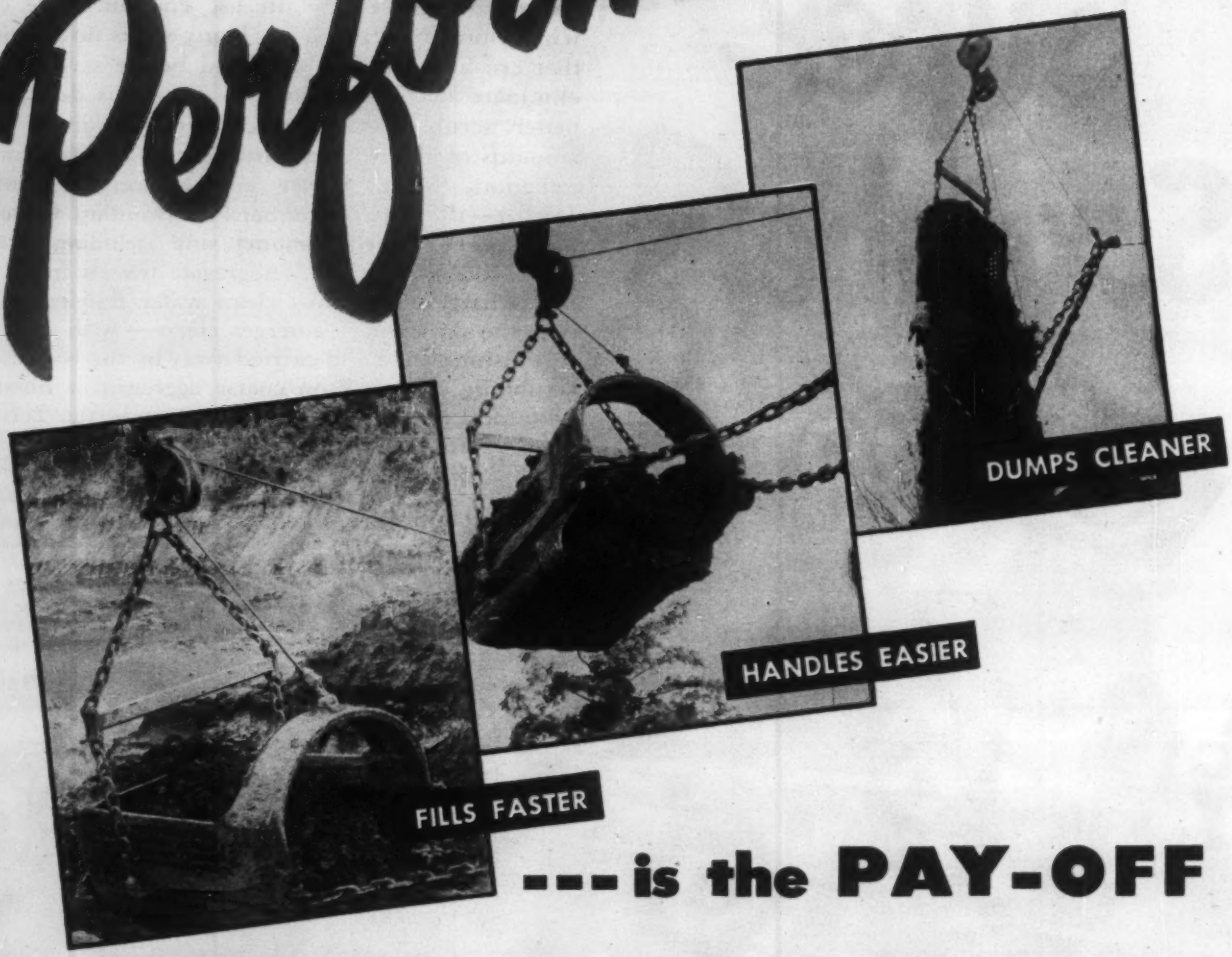
Performance



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A TYPE FOR
EVERY DIGGING PURPOSE

¼ to 40 Cubic Yards

Hendrix Lightweight Dragline Buckets

EXTRA PAYLOADS are the pay-off for the performance of Hendrix Dragline Buckets. Check with Hendrix users about actual job performance . . . yardage moved per day . . . maintenance and operating costs. Hendrix buckets are real money-makers because they *fill faster* . . . get a *full payload every trip* . . . and *dump cleaner* . . . all adding up to more payloads per hour . . . job after job!

All Hendrix Buckets available without perforations

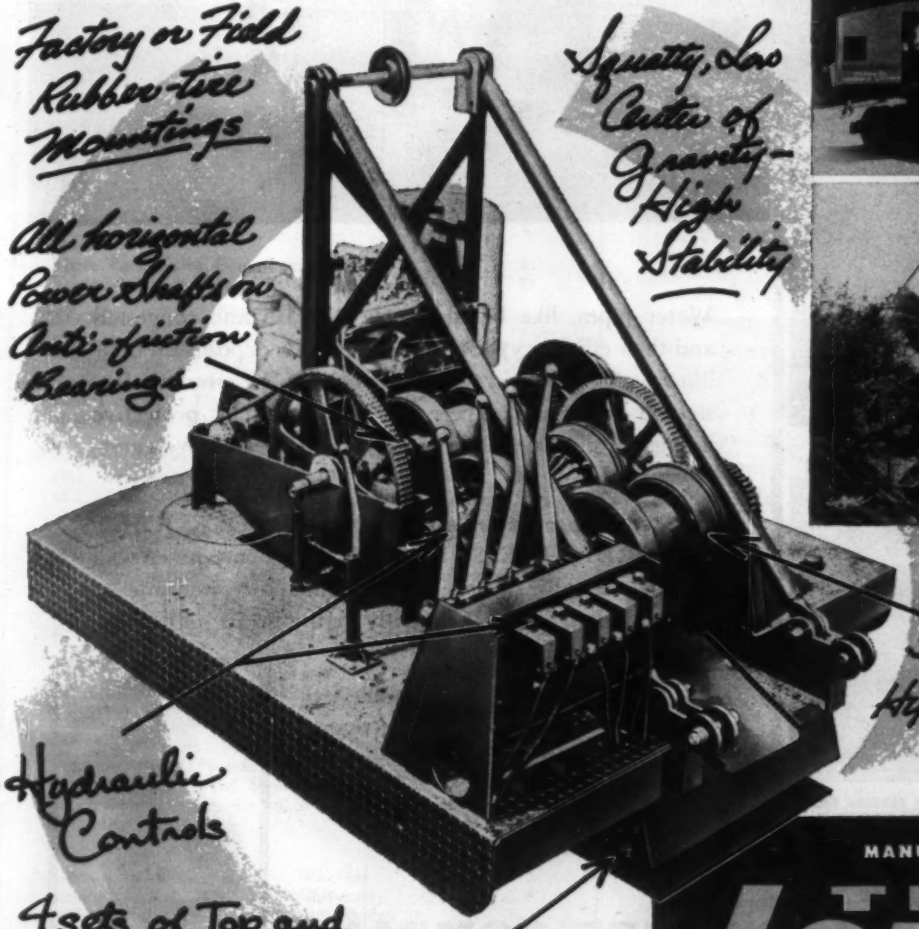
HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

THE NEW THEW LORAIN®

MODEL DIXIE

A NEW 3/8-YD. MODEL MADE, SOLD, SERVICED BY THEW-LORAIN

The acquisition of the 3/8-yd. "Dixie" model adds another go-getter to the Thew-Lorain line of products. Now manufactured by Thew, the "Lorain-Dixie" is competitively low-priced; doesn't have to back down on any comparison of quality. This proved 3/8-yd. machine now proudly carries the "Lorain" nameplate . . . is backed by all the handy parts stocks and service know-how of Thew-Lorain's entire nation-wide distributor organization. Get the facts today, because you'll be surprised at how much sheer quality and money-making performance you can get for so little money.


Factory or Field Rubber-tire Mountings
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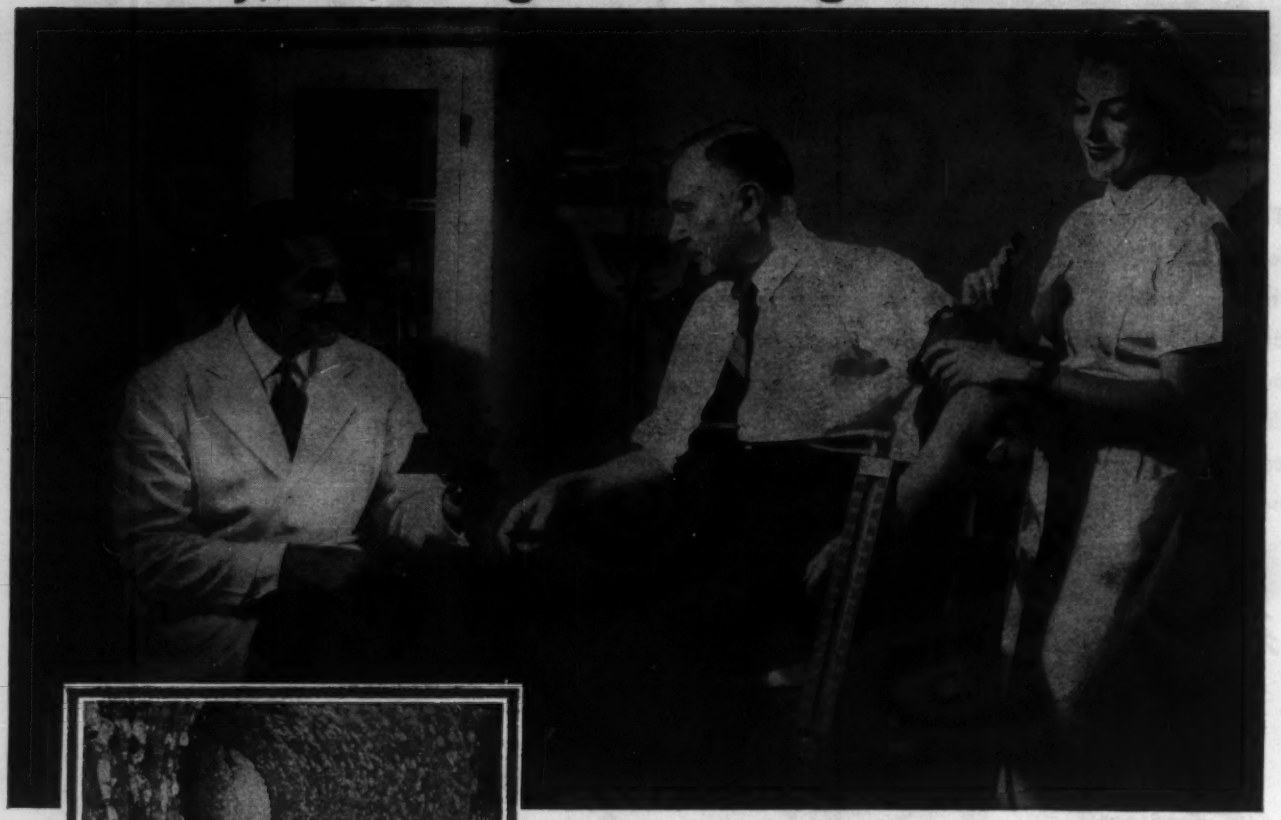
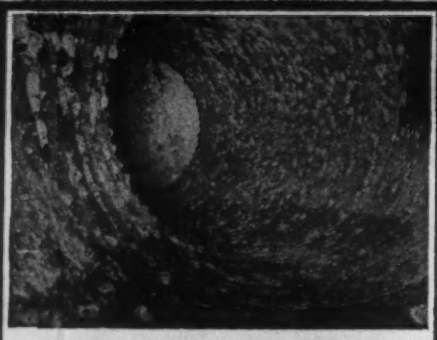
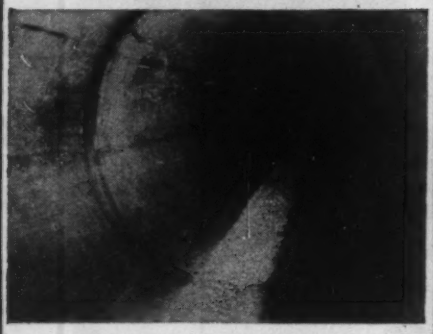
THE THEW SHOVEL CO., LORAIN, OHIO, U. S. A.

Your city, too, can get hardening of the arteries!





TUBERCULATION HAS SERIOUSLY REDUCED THE CAPACITY OF THIS PIPELINE.

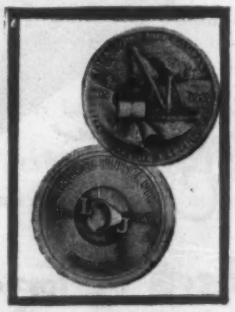


TWENTY YEARS OF SERVICE HAVE NOT REDUCED THE ORIGINAL HIGH CARRYING CAPACITY OF THIS LOCK JOINT CONCRETE PIPELINE.

Water pipes, like blood vessels, can become congested and their efficiency seriously impaired by deposits on their inner walls. To avoid this "hardening of the arteries", far-sighted hydraulic experts insist on added protective linings for pipeline materials adversely affected by aggressive water.

Such costly protection is unnecessary in LOCK JOINT CONCRETE PRESSURE PIPE. The dense inner wall of this virtually ageless pipe is inherently immune to tuberculation, and consequently maintains its initial high carrying capacity *permanently*.

Its great durability and trouble-free service assure you the most economical and efficient pressure pipeline obtainable.



LOCK JOINT PIPE COMPANY

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Sales Offices: Chicago, Ill. • Columbia, S. C. • Denver, Col. • Detroit, Mich. • Hartford, Conn. • Kansas City, Mo.

Pressure • Water • Sewer • REINFORCED CONCRETE PIPE • Culvert • Subaqueous

ENGINEERING NEWS-RECORD

Vol. 155, No. 21 November 24, 1955

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INDEX

NATIONAL AFFAIRS

It Won't Be a Bad Year for Builders 21-23
Too Little, Too Late; Power Fight Looms; Material Squabble 24
Ohio Turnpike No. 2 Hits a Snag 25
Towns Move Away From Man-Made Flood 26-27
The GM-Euclid Merger—Is It Legal? 28
School Conference Opening Next Week After 16 Months of Preparation 29

FEATURES

Tunneling by the "Slog-it-Through" Method 34
Plant Extrudes Concrete for Prestressed Precast Slabs 40
Exposing Steel for Appearance Affects Rigid Frame Design 43
The Two Sides of the Los Angeles Sewage Disposal Question 46
Bombed and Burned . . . Now Being Rebuilt Famous Walled City Rises from Its Ruins 54

INTERNATIONAL

Housing in a Hurry for Puerto Rico 61
Egypt's "High Dam" — The Aswan Project Moves Ahead but Slowly 67

NEW PRODUCTS

32-Yd Units Designed for Heavy Hauls 76
New Payloader Gets Bigger Bucket and 40-Deg Rollback 78
Mobile Plant Needs No Erecting Crane 80
22-Power Transit-Level Focuses down to Three Feet 84

FIELD AND OFFICE

Spare Parts Solve Compaction Problem 87
Trucks Without Wheels Solve a Hauling Problem 88

RESEARCH

Concrete Bridges on N. Y. Thruway Protected by Sprayed-on Silicone 93
Radiation Protection Is Goal of New Laboratory 93
How Fast Does Fire Spread? 94
High Strength Alloy Is Developed for Hot Driving 96

MEN AND JOBS

New State Engineer Named to Temporary Post 101
M-C&S Announces Changes in Construction Department 102
Koppers Company Engineers Change Construction Jobs 104
Construction Service Award to F. Stuart Fitzpatrick 104

BUSINESS AND FINANCE

Architects Do Most Design for Non-Industrial Buildings 144-45
Activity This Week 146
Tri-State Toll Project Hinges on Future Showing of West Virginia Turnpike 146

LABOR

Contractors Ask President Eisenhower to Investigate Western Teamsters' Strike 148
NLRB Appointments Go to Stephen Bean and Boyd Leedom 148

Readers Comment 8
Calendar 12
Washington Observer . 19
Weather 75
Obituaries 108
Unit Prices 142
Editorials 164

Back issues of ENGINEERING NEWS-RECORD *are generally available for the previous six months. Price 35¢ each copy except Annual Cost Issue. Semi-annual indexes will be sent on request.* ENGINEERING NEWS-RECORD *is also indexed in Industrial Arts Index and Engineering Index.*

THE CONSTRUCTION WEEK

SOME BUMPS FOR HOMEBUILDERS—Although no serious decline in homebuilding looms for '56, an ENR survey of builders and mortgage bankers confirms previous indications that this type of construction is due for a slow-down this spring (Page 21).

In many places, demand for new homes already is suffering from the tighter FHA and VA mortgage terms—less from the higher downpayment requirements than from the higher monthly charges.

The more restrictive government lending policies, however, constitute only one aspect of a developing squeeze play. And, as a matter of fact, these policies would be eased at the first sign of a substantial downturn anyway.

Other problems facing homebuilders are more complex. For one thing, the ENR survey shows that raw land costs are going up at an alarming rate in many metropolitan areas. Besides, developers are having to share more of the costs of installing sewerage, water supply and other facilities. Builders are finding they must absorb a good percentage of these and other higher costs—making it particularly tough on the small builders.

CONTINUOUS CONCRETE CASTING—A machine for continuous casting of concrete now busily producing prestressed slabs in a Mid-West precasting plant (Page 40) may bring about substantial changes in U. S. technology.

Henry Nagy, president, West Allis Concrete Products Co., Milwaukee, imported the device from Germany after hearing about it from a friend and has sewed up Western Hemisphere distribution rights. Enthusiastic about its performance in his plant, he also believes it can be adapted to other uses. He says it is in use in Germany extruding concrete pavements. Three other machines already have been sold in the U. S.

THE DESIGN BUSINESS—This week ENR completes its annual series on new business taken on in the previous year by contractors, engineers, architect-engineers, and architects (Page 144). Now it's possible to compare the design business of the three latter groups.

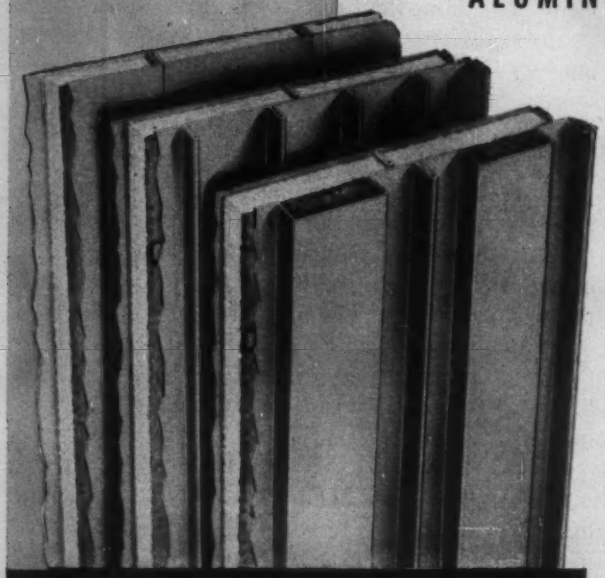
Consulting engineers are ahead. They worked on about $6.2 billion worth of jobs—$4.5 billion in heavy construction outside of building, about $1 billion in non-industrial building, and close to $700 million in industrial buildings. They led the field on industrial building, and of course in heavy construction.

Architects got 68% of non-industrial building design—jobs whose value amounted to the tidy sum of almost $5.6 billion. They worked on about $451 million of jobs in other fields. Architect-engineers also did a respectable volume of design in all three categories. They did more work than engineers in the non-industrial building field.

INSULATED METAL WALLS

for INDUSTRIAL and COMMERCIAL BUILDINGS

ALUMINUM, STAINLESS or GALVANIZED STEEL



FLUSH, RIBBED, or FLUTED
Over-all "U" Factor of Various Types is Equivalent to or Better than Conventional 16" Masonry Wall

More architects are designing insulated metal walls into more types of buildings every day . . . they are taking advantage of the low-cost permanence of this light weight stainless steel or aluminum curtain wall construction. New, modern industrial and commercial buildings with bright, attractive exteriors are appearing in every part of the country. In monumental buildings, too, aluminum and stainless steel are being employed in combination with brick and stone to produce attractive exterior design effects. Before you design your next building, investigate the savings in material and labor costs, and the cumulative savings deriving from reduced construction time, which is always a plus factor when buildings are enclosed with quickly erected insulated metal walls. Have a Mahon engineer give you the complete story . . . also have him show you some outstanding examples of architectural treatment in all-metal exterior design, and some distinctive and very attractive exteriors with Mahon Insulated Metal Walls in combination with brick, stone, glass block and other materials. Mahon Insulated Metal Walls are available in the three exterior patterns shown at left . . . the "Fluted" and the "Ribbed" walls can be erected up to sixty feet in height without a horizontal joint—a feature of Mahon Walls which, from an appearance standpoint, is extremely important in powerhouses, auditoriums, and other types of buildings where high expanses of unbroken wall surface are common. See Sweet's Files for information including Specifications, or write for Mahon Catalog W-56.

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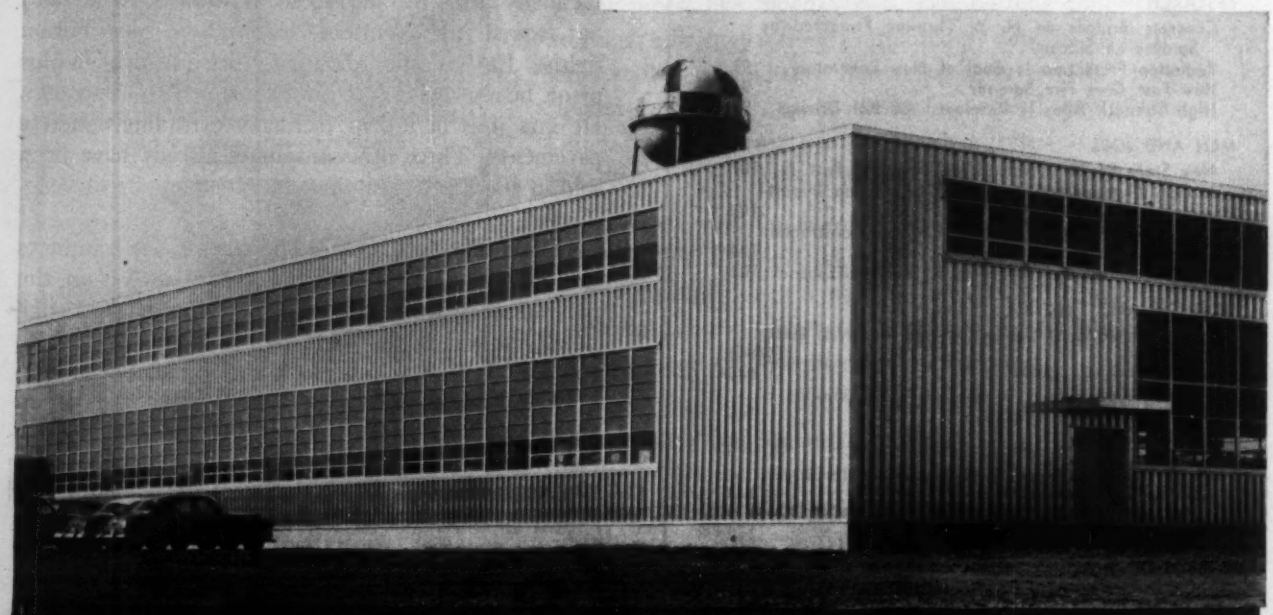
Manufacturers of Insulated Metal Walls and Wall Panels; M-Floors (Electrified Cel-Beam Floor Systems); Steel Deck for Roofs, Partitions and Floor Forms; Rolling Steel Doors, Grilles and Underwriters' Labeled Automatic Rolling Steel Fire Doors and Fire Shutters.



MAHON

WASHINGTON OBSERVER

Keep your eye on Senator Sparkman's hearings on housing credit next week. He's going to call in experts—both from the Administration and outside.

Eisenhower's top officials will state their case—from the Federal Reserve Board, Treasury, housing agencies, and the like.

The easy-money-for-housing bloc will get all the time it wants, during the two days scheduled. Builders, lenders, and economists will speak their piece at the first examination by Congress of the credit restraints that affect home building.

The Administration is sure to stick to its present money curbs. Last week's increase in the discount rate shows this. But the tightening will put more fire into the fight over hard money policies.

The restrictions on mortgage terms are something else again. Already, there are signs of minor loosening. For example, terms of FHA mortgages have been eased for servicemen, and financing of low cost housing for those removed in slum clearance operations has been made easier.

•

The Administration has publicly given up its Clay plan on highway financing. Secretary of Commerce Weeks made it official after talking to Eisenhower in Gettysburg.

Weeks said the Administration is now working on pay-as-you-go plans to take to Congress next year, that the idea of setting up a special corporation to issue highway bonds is out.

This means scrambling by Democrats and Republicans over which can come up with a scheme to raise enough in new taxes that will get the new highways built. The search and the compromises will involve mostly these questions: How much to increase the gasoline tax that all motorists pay, how much to increase taxes on tires and the like—and how much more, if any, should trucks pay than the man who drives his own car.

The truck lobby is reported to be backing a plan which calls for a one-cent gas tax increase, and increased taxes on all sizes of tires and tubes. Last year the House Democrats were defeated on a measure that included relatively high increases on truck size tires.

•

Administration has adopted the Air Force rule on dispersal of defense plants. In general, it means an end to the confusing attempts of past year to get defense facilities—both those making military end-items and defense supporting plants—out of the big metropolitan areas that are "target areas."

The rule is: No all-out drive to disperse—the military will make as much use as possible of existing plants for producing weapons, whether they are in target areas or not.

But when new plants are needed, they'll be put outside the cities. There is this twist, though:

Government aid to defense contractors for additions to plants even inside target areas will be forthcoming, regardless of dispersal.

•

Add-X2, the controversial battery additive, isn't falsely advertised according to a Federal Trade Commission hearing examiner. After hearing evidence on all sides, the examiner found:

Weight of scientific evidence is against Add-X2 being of value in restoring weak or dead batteries.

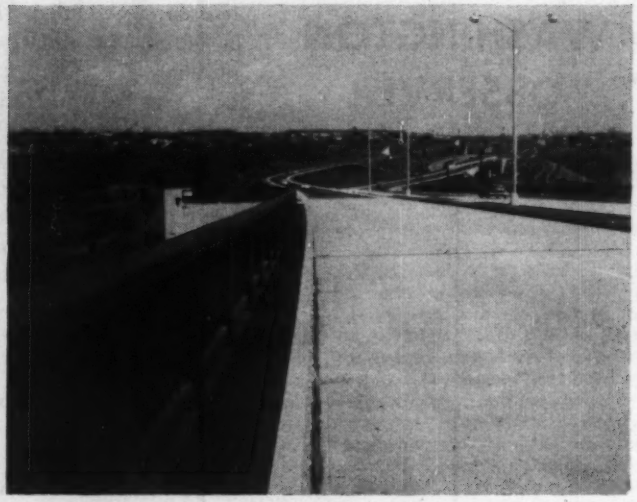
But weight of user evidence, upheld the product. Plant superintendents, shop foremen, chief electricians and the like testified that the product helped make batteries more efficient, last longer, and cure various battery ills.

BORDEN
First IN FLOOR GRATING

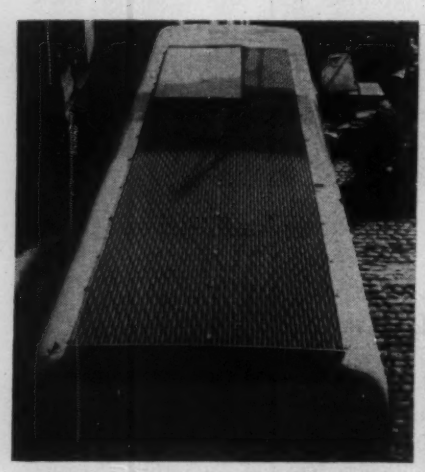
USES OF GRATING . . . WHERE ONLY BORDEN QUALITY WOULD DO . . .

Here on this page are a few of the many new or unusual uses for grating being pioneered every day. Each is an exacting job where only standards of quality equal to BORDEN'S will do.

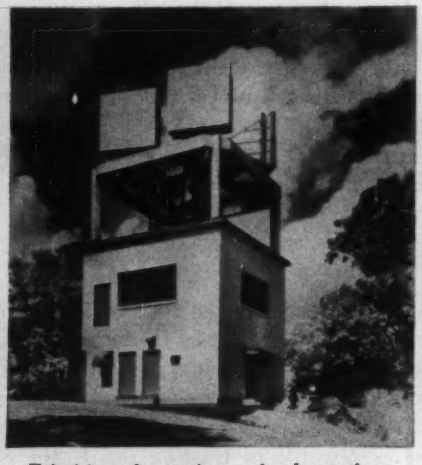
And remember . . . BORDEN manufactures every type grating in ferrous and non-ferrous metals.



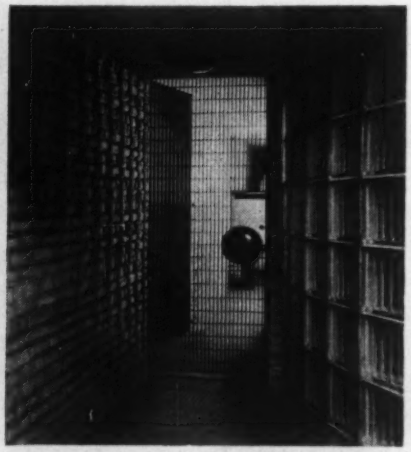
ON THE NEW JERSEY GARDEN STATE PARKWAY . . . Shown here, Borden R/WL Roadway Grating fabricated to exact sizes for sidewalks and center mall on the N. J. Garden State Parkway. Remember, where schedules and dependable performance count, always SPECIFY BORDEN.



Wherever this Color Television truck goes, whatever the assignment of the reporters who must mount its roof, Borden riveted *serra-crimp* grating will mean surerfooting —even in ice or snow.



Television relay stations and radar stations that gird our continent have adopted grating as standard outside platform material. It will not collect snow as most other platforms will.



Only the finest precision manufacturing would satisfy the architect who designed this door. BORDEN is recognized as a leader in quality, custom-manufactured gratings.

BORDEN METAL PRODUCTS CO.

Gentlemen:

Please send me BORDEN Catalog

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TITLE .....

COMPANY NAME .....

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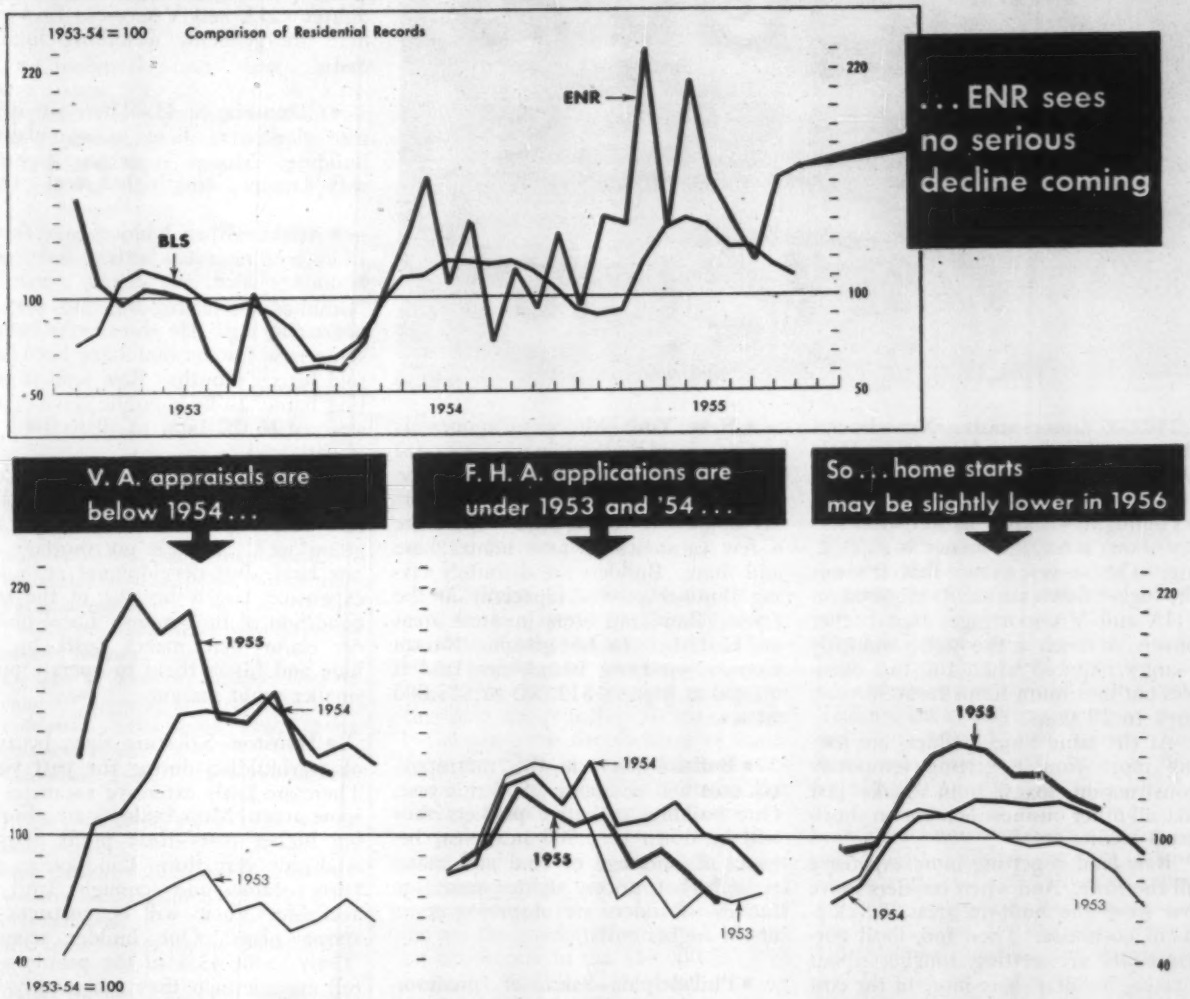
1956 Home Starts: May be Down, But...



It Won't Be a Bad Year for Builders

As the building year draws to a close, homebuilders are keeping their fingers crossed about plans for next spring. As the figures on home starts and applications for government-insured mortgages show (above), they are already starting to feel the effect of tighter mortgage money, and stiffer mortgage terms. But there is another factor that bothers them in many areas—the shortage of available raw land that can be developed at reasonable prices.

That's the gist of a nation-wide ENR survey this week of builders and mortgage bankers. But ENR's contract awards also indicate that no serious decline in homebuilding is in sight. As you can see from the top chart (above), ENR's housing awards have generally provided an advance indication of the trend of home starts. While contract awards dropped very sharply this year, they have been climbing up again during the past two months.

True, it is the smaller builders who are feeling the pinch most so far. And operations of many of these builders are not reflected in ENR contracts, which do not include contracts or tract development under $344,000. But it's very unlikely that home starts will go into a tailspin next spring when ENR awards show such a strong uptrend now. ENR has already predicted (Oct. 20, p. 21) a 7% decline in its private residential contract series for next year. That would not be a serious drop from this year's estimated record volume of $6 billion. So 1956 will not be a bad year for homebuilders, even if it doesn't break any records.

• **Political reasons**—Practical political considerations indicate, too, that the Administration will not allow its credit curbs to break the back of the building boom. Just recently, for instance, Housing & Home Finance Administrator Albert Cole said that the Administration would adjust its policies next year if necessary to assure about

Some Areas May Still Boom While . . .

1,250,000 home starts. New homes this year are expected to run a little over 1,300,000.

• **Highlights**—ENR's nation-wide survey shows mortgage money is tightening. The survey shows that it's not the higher down payments required on FHA and VA mortgages that bother buyers, so much as the higher monthly charges required when the two agencies cut maximum terms from 30 years back to 25 years.

At the same time, builders are having more trouble getting temporary construction loans from banks—just like all other businessmen are on short-term credit.

Raw land is getting more expensive all the time. And when builders move out from the built-up areas, development costs rise. Then too, local governments are getting tougher about making builders share more of the cost of paving and sewerage.

Here is a city-by-city rundown of the ENR survey:

• **Boston**—Mortgage money is traditionally plentiful here. So well-established builders have no trouble getting money. Small builders, though, do have difficulty. In general, builders plan only slight price rises next year, expecting a narrower profit margin. They look forward to good spring sales. Higher costs of raw land are driving the big developers 20 to 25 miles out of Boston.

• **Hartford**—Both tract builders and small builders expect larger programs in the spring. This area is booming. Model homes in the new housing developments are attracting huge crowds of people.

• **New York**—Mortgage money is not too hard to find in this area for builders with established records. The area is growing rapidly, and builders say homes are selling well. There are a few vacancies of new homes here and there. Builders are definitely taking slimmer profits, especially in the tracts. Raw land costs in some areas are fantastic. In fast-growing Nassau County, on Long Island, raw land is quoted as high as $11,000 to $13,000 an acre.

• **Buffalo**—Starts in this metropolitan area will be about 7,800 this year. One building executive predicts they will be down to 6,500 next year because of: shortage of land and materials; higher prices; tighter mortgage money. Builders are absorbing some of the higher costs.

• **Philadelphia**—Sales of medium-priced homes here are going well, but the market for lower-priced homes ($11,000 and under) has softened. There are few new homes vacant. This has not been a record year, though a good one. Next year is expected to be about the same, or slightly below. Raw land costs are going up.

• **Pittsburgh**—Sales have been declining for several months, and are still dropping. But new houses that are built are being sold readily in this area.

• **Cleveland**—"Sales here are tougher, a lot tougher," the Home Builders Assn. reports. But mass builders don't appear to be worried much. The effect is felt mostly by the small and medium-sized builder, who is having trouble getting financing.

• **Baltimore**—Sales are good here now, but spring cutbacks are likely. The crackdown by the Home Loan Banks on savings & loan associations (ENR Sept. 22, p. 50) has had a much greater braking effect here than the tighter FHA and VA rules. Builders here are generally absorbing higher costs.

• **Columbia, S. C.**—There's a definite slackening here in speculative building. Money is getting tighter, with lenders asking higher fees.

• **Atlanta**—Most builders here think 1956 will be even better. Sales are booming. But one lender remarks: "Builders are talking big, but they're not acting big." He also says he knows some new homes that have been unsold for six months. Raw land is getting harder to find; public services are strained to the limit in all sections.

• **New Orleans**—Builders here expect a 20% decline in starts after the new year begins. But so far sales are going well. There's no shortage of raw land. But development costs are expensive, largely because of the soft condition of the ground. Local builders claim that makes costs higher here and forces them to operate on a smaller profit margin.

• **Houston**—Sales are slow, because of overbuilding during the past year. There are fairly extensive vacancies in some areas. Most builders are absorbing higher costs—their profit margin is already very thin. Land prices are fairly stable and enough land is available. There will be cutbacks in spring plans. One builder reports: "Only about 45% of the people who tell my salesman they can qualify for a loan actually are able to get the mortgage. It's the big car sales that are hurting sales of homes."

• **Dallas**—The boom continues here, but builders are cutting back slightly on their spring plans. Builders are offering more value for the same price. Raw land is rising in cost. Development costs are higher, partly because tracts are further away from the center, and partly because the city forces builders to share more of the costs of utilities.

• **St. Louis**—Sales of new homes are down about 10% now. But not much cutting back on spring plans is reported. Prices are expected to be higher next year because of wage increases. Costs of $5,000 an acre for raw land are not uncommon.

. . . Others Will Continue Fair to Moderate

• **Kansas City**—Starts in the metropolitan area may drop from 12,000 this year to 10,000 in 1956. Reasons: tight money; development costs. Sales have slackened only a little, but buyers are more selective. Builders are passing along higher costs.

• **Cincinnati**—Some new homes have been for sale two or three months. A few builders have actually cut prices. Due to terrain in this area, development costs are exceptionally high.

• **Detroit**—Sales are a little slow, but there are no widespread vacancies. Builders are cutting back on spring plans; they're absorbing higher costs now. Last week, for instance, one of the bigger builders withdrew 100 homes proposed for next spring because of financing difficulties. Good raw land is getting more expensive all the time. Lack of water and sewerage make a lot of raw acreage unattractive for development.

The U. S. Roundup

Boston—Next spring will be good.
Hartford—This area is booming.
New York—Sales high, but profits are slimmer.
Buffalo—15% decline expected.
Philadelphia—Low priced homes market is softening.
Pittsburgh—Sales have been down for several months.
Cleveland—Smaller builders having trouble.
Baltimore—Sales good now; spring cutbacks likely.
Columbia, S. C.—"Definite slackening."
Atlanta—Builders think 1956 will be even better.
New Orleans—20% decline expected.
Houston—Sales slow; there has been over-building.
St. Louis—Sales down about 10% now.
Dallas—Boom continues; slight cutbacks in spring plans.
Kansas City—Starts may drop about 15%.
Cincinnati—Some builders have cut prices.
Detroit—Builders cut back spring plans.
Chicago—Shortage of materials worries builders.
Omaha—The usual slack season started early.
Denver—Some big cutbacks here.
Phoenix—Demand here high and steady.
Los Angeles—Market very competitive.
San Francisco—Most builders don't plan cutbacks.
Portland—Medium-priced market is slow.
Seattle—Market is down a little.

• **Chicago**—October set a new record for this month for homebuilding permits in the Chicago area. However, building of homes and apartments has been declining gently for the past six months. What worries builders most is the shortage of materials, especially cement. Some are absorbing price increases. Others are passing them along to their customers.

• **Omaha**—This is the slack season for home sales, but it started earlier than usual. A few more unsold units are on the market than usual. Hardest hit: homes in the $18,000-$25,000 bracket. Builders are not cutting down on plans, though. Big builders are absorbing little, if any, of rising costs. Smaller ones, with less financial backing, are absorbing higher costs in order to stay in business.

• **Denver**—Some builders are making substantial cutbacks in spring plans. One is down 60% compared with last spring. Builders are absorbing most of the higher costs in tract developments, though on higher-priced homes they generally are able to pass them along. Raw land in this area has jumped from $1,500 an acre three years ago to $4,500 now.

• **Phoenix**—The demand here is high, and steady. Plenty of mortgage money is around. But some builders—chiefly the smaller ones—can't afford to pay the premium. Larger developers are going ahead with plans for 100 units or more. Builders are absorbing about 20% of higher costs. The rest is paid by the buyer. Raw land that 10 years ago was selling for $50 an acre now goes for $3,000 to $4,000. But there's still plenty of land outside the 10-mile perimeter.

• **Los Angeles**—The slack season came earlier than usual here. Builders are absorbing the bulk of higher costs. The market is very competitive; there are some unsold new homes. Raw land occasionally sells here as high as $10,000 an acre.

• **San Francisco**—Sales are going well; most builders are not talking about cutbacks yet. However, there are some vacancies. Builders are giving more value for the same money. Undeveloped land is almost impossible to find in the nine-county San Francisco Bay area, except at terrific prices.

• **Portland**—One builder of $12,000-$15,000 homes says: "This market is shot. Most of these homes are bought by men with $400 to $450 per month income. Dropping the terms to 25 years has added $5-$6 extra to monthly payments—and they just can't qualify. I haven't sold one home yet at 10% down, 25 years to pay—and I've offered my salesmen bonuses."

• **Seattle**—Some builders are cutting back their plans. One big builder has pulled out almost entirely. Cost of raw land is rising, with no stopping point in sight. Developed lots in the city are being sold at from $2,000 to $2,500.

Too Little, Too Late

State Health Board says consultants ignore need for sewage work speedup

The Florida State Board of Health has taken issue with Metcalf & Eddy's recommendations for a $146-million sewage program for Jacksonville (ENR Feb. 24, p. 32).

While stating that the Boston consulting firm's report was "a fine piece of work," State Health Officer W. T. Sowder disagreed with scheduling of certain aspects of the long-range program.

The board feels that construction of intercepting sewers serving areas outside of the city should not be delayed for 25 years as the report recommends. Figures were quoted to show the growth of subdivision sewage systems and the need for early service to them.

The board also criticized the proposal that construction of a sewage treatment plant be delayed.

A third point of contention was the firm's suggestion that raw sewage be discharged into the St. Johns River through a 2,500-ft deep water outfall. Such an outfall, the health agency said, would result in further pollution affecting tributary streams such as the Trout and Arlington Rivers which flow through residential areas.

The board cautioned against "halfway measures" and added this warning:

"Please accept this as an official notice that the State Board of Health intends to resist by all the legal means available any attempt to materially increase the present sewered areas of Jacksonville without approval of plans and specifications by this office and such approval will only be given if it is coupled with adequate treatment of the sewage."

Power Fight Looms

Utility expansion plan would preempt damsite

A projected Corps of Engineers water storage dam on the Potomac River, above Washington, D. C., has been thrown into a local fight to prevent Potomac Electric Power Co. from adding a $100-million, 300,000 kw steam plan in northern Virginia to expand its present system, which is operating near peak capacity.

Discussions of the Engineers' plans for the dam last week highlighted a hearing on PEPCO's proposal before a special Senate subcommittee, headed by Sen. Wayne Morse (D-Ore.).

Col. Ray Adams, of the District of Columbia Army Engineers' Center, brought up the dam in arguments against the new PEPCO plant.

Adams testified the dam will be needed by 1970. He said it would insure future water supplies for Washington and its fast-growing suburbs in Maryland and Virginia; provide supplemental irrigation for neighboring farmlands; and insure stream flow of 650 mgd to carry pollution past the city.

Army Engineers contend that construction of the steam plant would preempt the dam storage site, since the plant would be built at an elevation of 210 ft above sea level, upstream from the dam. The dam is planned for elevation 240 and would flood the PEPCO steam plant site.

Revival of the dam plan is the latest in a string of arguments against construction of a power plant at the site chosen by the company. District Engineers have previously opposed the utility's expansion plan on the grounds that the power plant would raise the temperature of the river water by about 10 deg, thereby incubating bacteria that would affect the water's taste and odor. But PEPCO put experts on the stand last week to deny that the plant's heating effect would result in serious changes in the water's characteristics.

Soil Cement Is Twenty Years Old

Back in the thirties, South Carolina was the first state to experiment seriously with soil cement bases for bituminous surface roads, and then to make extensive use of such bases (ENR Nov. 28, 1935, p. 751).

Recently the state opened one of these old pavements—said to be the nation's first fully engineered soil cement project. It was found to be in good condition as demonstrated above in this test section.

Records revealed that 7% of cement had been mixed with the natural sandy clay soil and that the compressive strength of the mixture had been 480 psi. Samples tested when the road was opened up after twenty years service averaged 922 psi. The highway involved is state route 41, which carries 2,900 vehicles daily.

Material Squabble

PCA protests alternate bids on local paving

The running war between portland cement concrete and asphalt has gone from the big battlefield of the Connecticut Turnpike (ENR Sept. 29, 1955, p. 71) to local skirmishes. Seattle, Wash., offers the latest example.

The cement industry has objected to the policy of the Seattle Municipal Board of Public Works in calling for alternate bids on concrete and asphalt in street paving projects. Prior to the introduction of the alternate bid policy, portland cement concrete was specified.

R. H. Lochow, Portland Cement Assn. district engineer, told the Seattle City Council that "In all the paving jobs proposed since the new policy was adopted, residents have overwhelmingly requested concrete paving. . . . It would seem to be a waste of time and money to ask for alternate bids."

Lochow also denied the assertion of City Engineer W. E. Parker that the alternate bid system resulted in "certain well-defined savings."

The City Council permitted the alternate bid system to stand.

Ohio Turnpike No. 2 Hits Snag

Final feasibility report indicates that two sections but not entire 399-mi route capable of meeting revenue needs

Final report on a two-year revenue study of Ohio's proposed Turnpike No. 2 casts doubt on the feasibility of constructing the entire 399-mi route from Cincinnati to Conneaut, which has been given a price tag of $575 million.

Findings of the New York engineering firm of Coverdale & Colpitts indicate that only two sections—one on either end of the proposed route—would be lucrative enough to attract investment money. These are a link between Cincinnati and Route 40 and another between the Pennsylvania border and Ohio Turnpike No. 1.

Engineers estimate these two sections would yield 2.07 times debt service requirements, whereas for the entire route the ratio would be only 1.46 and including the proposed Toledo-Columbus spur, only 1.21.

Investment houses usually have a rule of thumb that such projects must produce 1.5 times interest and amortization. Therefore, Ohio officials believe that the turnpike would bring enough revenue to pay for its construction and operation—but not enough to provide the safety margin demanded by investment houses.

Although detailed figures of the study have not been made public, Highway Director S. O. Linzell reports that the Cincinnati-Route 40 link represents 34% of the total estimated project cost and 22% of the gross revenue. The Pennsylvania line —Turnpike No. 1 link represents 27% of the total construction cost and 46% of the gross revenue. Thus, together they would cost 61% of the total and bring in 68% of all revenue.

Gov. Frank J. Lausche says that the traffic-study firm estimates 1961 revenues at $29.1 million, of which $6 million would be necessary for operating costs. The remaining $23.1 million would be available for payment of interest and the establishment of a fund for bond amortization.

"Assuming that the cost of financing will be similar to that which prevailed in the financing of Turnpike No. 1," explains Governor Lausche, "calculations show that on an interest rate of 3¼% on the full project, including the Toledo spur, the revenues collected in 1961 would be 1.21 times interest requirements."

Financing has been estimated at $60 to $80 million in addition to the estimated construction cost of $516 million. J. E. Greiner Co., Baltimore consulting engineers, have already submitted a preliminary engineering report on the project (ENR Nov. 10, p. 24).

Ohio officials are not expected to make any definite pronouncement until they complete additional study. They reportedly are discussing the desirability of dropping the Toledo spur and continuing with the entire Cincinnati-Conneaut route.

Meanwhile, various other engineers proposed that the entire turnpike be rejected. They suggest that the state turn its $500-million bond issue plans —plus normal receipts and federal aid —to build a $1-billion four-lane highway net to carry traffic into every section of the state.

Court Backs Award

Highway chief has right to pick paving material

A New Haven superior court has refused to issue a temporary injunction to stop Connecticut's State Highway Commissioner from awarding a contested turnpike-paving contract.

The injunction suit grew out of a controversy over portland-cement concrete and bituminous concrete as the paving surfaces for the Connecticut Turnpike (ENR Nov. 3, p. 25).

The action was brought by L. G. DeFelice & Son, Inc., North Haven, Conn., which submitted a bid of $4,728,527 for building a 3-mi turnpike section at Milford of bituminous concrete pavement. Savin Construction Corp., East Hartford, Conn., bid $5,006,411 for the same job on the basis of portland-cement concrete.

DeFelice contended that although Commissioner Newman E. Argraves had authority to ask for alternate bids —as he did on the Milford section—he was forced to show cause if he awarded the contract to other than the lowest of all bids submitted on the various alternatives.

The State Highway Department argued the DeFelice had "no vestige of legal right" in its action, asserting that Commissioner Argraves was fully within his powers to choose the portland-cement concrete for the disputed section.

A few weeks ago the state's turnpike attorneys decided that Commissioner Argraves could specify the type of paving to be used. Since then, Argraves announced that the first 53 miles of the turnpike from the New York State line to Branford will be paved with portland-cement concrete, with one exception. From Branford to the Rhode Island State line near Killingly, Conn., bituminous concrete will be used.

Commissioner Argraves has not officially awarded Savin the contract for the Milford section, but his announcement that the stretch will be constructed with portland-cement concrete practically assures the firm of the work.

On his decision holding that Commissioner Argraves was within his rights in awarding the contract, Judge Charles S. House said the court would not interfere with "the discretionary powers vested in a public official in the absence of fraud, corruption, improper motives or influences, plain disregard of duty, gross abuse of power or violation of law."

The judge also held that the bidder cannot compel the awarding of a contract to himself merely because his bid is the lowest because such provisions are enacted for the benefit of the public and not the bidder.

Meanwhile, the Savin firm is the apparent low bidder for more than $14-million worth of work on sections of the Connecticut Turnpike in Fairfield. Its bid price of $10,797,151 was low for construction of nearly seven miles of the pike, along with nine bridges in Darien and Norwalk, three bridges in Westport, and a substructure of the Saugatuck River Bridge. In addition, Savin appears to be low with a bid to build the substructure of the Housatonic Bridge at Stratford and Milford for $2,601,372.

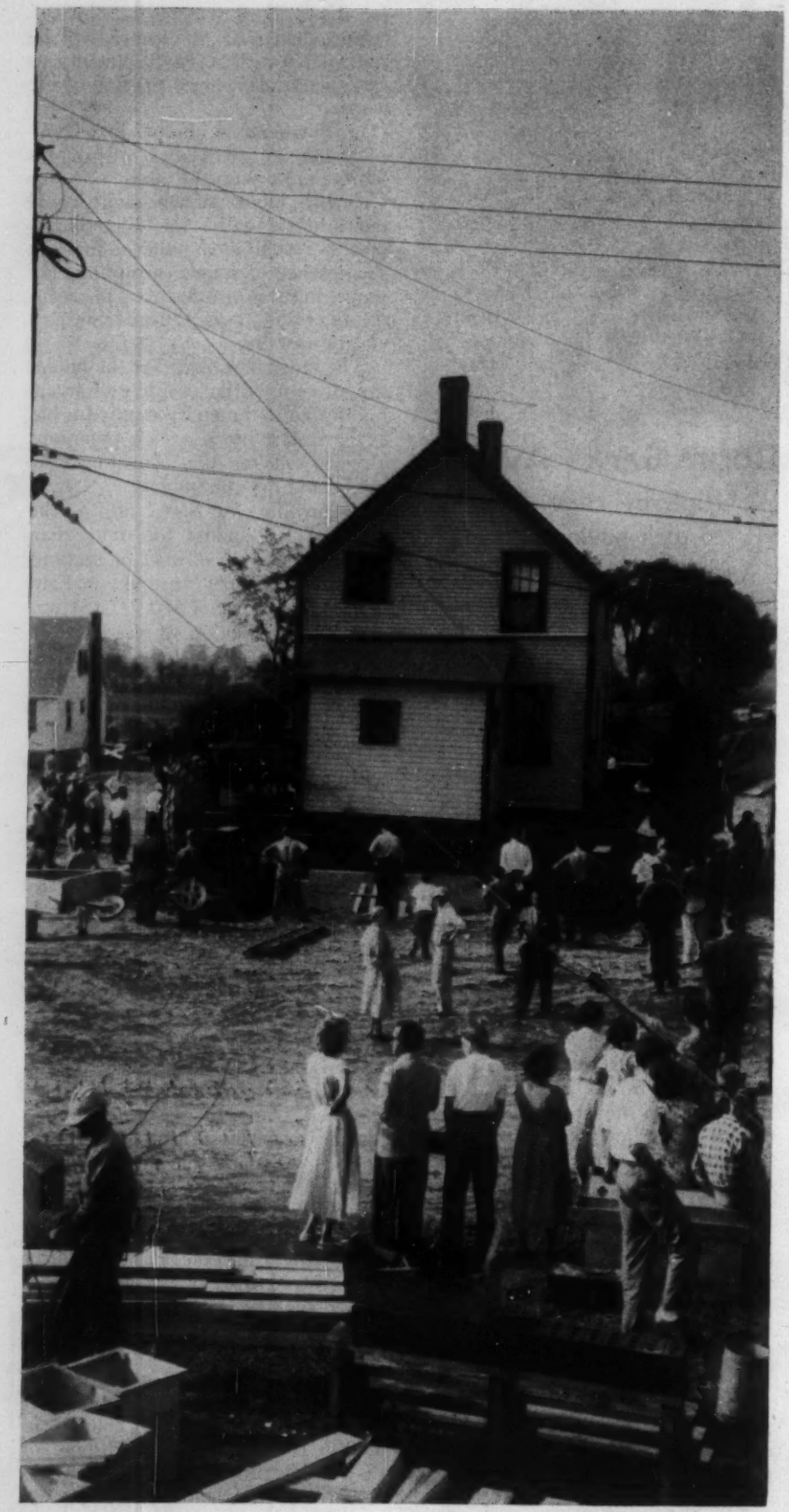
Housing Bill Wins Approval Of Wisconsin's Legislature

A bill permitting liquidation and disposal of public housing projects has been passed by the Wisconsin legislature.

The new legislation is aimed particularly at Milwaukee, but will also effect the state's 19 other housing authorities. Under the measure, a public housing authority must dispose of its projects by sale to the highest bidder when so directed by a municipality's governing body or by referendum of its voters.

Two other bills on the same subject were vetoed by Gov. Walter Kohler earlier this year (ENR Aug. 18, p. 26). The first measure would have given the Common Council complete control over the housing authority, its budget, employes and operations. It would have enabled the council to abolish the authority and dispose of its housing projects. The second bill would have required referendum approval before construction of any public housing project that did not pay full taxes.

Water Coming in 3 Years—Towns Move now



House move starts with two-story, frame structure resting on steel beams on huge machine which will carry it to new site.

Housemoving has become a major operation on the Canadian side of the St. Lawrence River power and navigation project as entire villages prepare for the day when their areas will go under water because of a man-made flood scheduled for 1958.

Machines are digging new house excavations, new streets are being laid out, and sewer and waterworks facilities are being arranged in a group of new townsites along the Canadian shore west of Cornwall, Ont.

Some 20,000 acres along a 35-mi stretch of the river's north shore will be flooded, affecting some 6,500 people, who are living in the villages of Iroquois, Aultsville, Farran Point, Dickinsons Landing, Wales, Moulinett, and Mille Roches, and in the river frontage area of Morrisburg. About 225 farms will be affected.

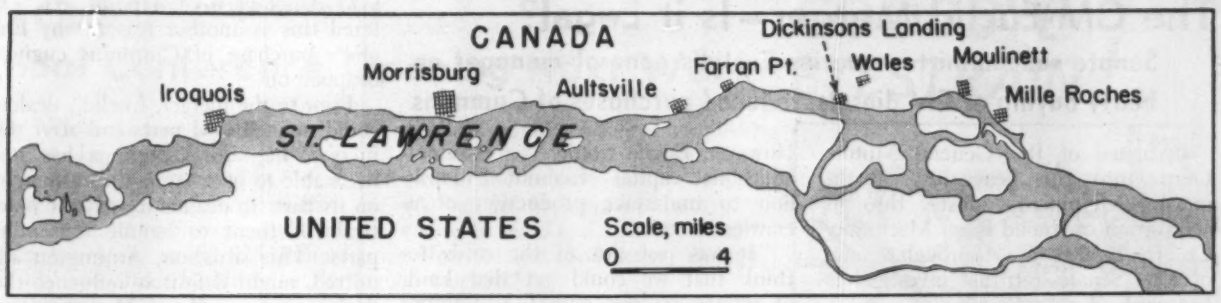
The villages and farms are being evacuated gradually. Including the railway line and highway being relocated now, cost of relocation on the Canadian side is estimated at $70 million.

On the United States side of the river, some 18,000 acres will be flooded, requiring the displacement of 225 farm families and 500 cottage owners. Although the amount of flooding is as great as on the Canadian side, it affects an area that is more sparsely populated. For this reason, relocation cost is much lower—an estimated $15 million.

• **Every day is moving day**—The housemoving process goes on almost every day on the Canadian side. The village of Iroquois is the first to be relocated. New streets have been laid out about a mile north of the present village and contracts have been let by the Ontario Hydro-Electric Power Commission for new sewers and water mains in the new village. Home owners are given the option of having their present homes moved to new sites or building new homes.

Two big housemoving machines have been brought in from the United States to carry homes from the old village to the new site. Most of the houses being moved are two-story frame structures with concrete basements.

In the moving process, the house is first placed on steel girders positioned through openings made in the basement walls. At the same time, a new basement foundation is being cast on the site where the house will be relo-



St. Lawrence power development requires flooding of eight villages that will be relocated.

cated. When the basement is ready at the new site, electricians disconnect power lines from the house. Then the housemoving machine lifts the house on its steel beams and moves it to the new site. Everything is left in the house—even to the dishes on the dining room table.

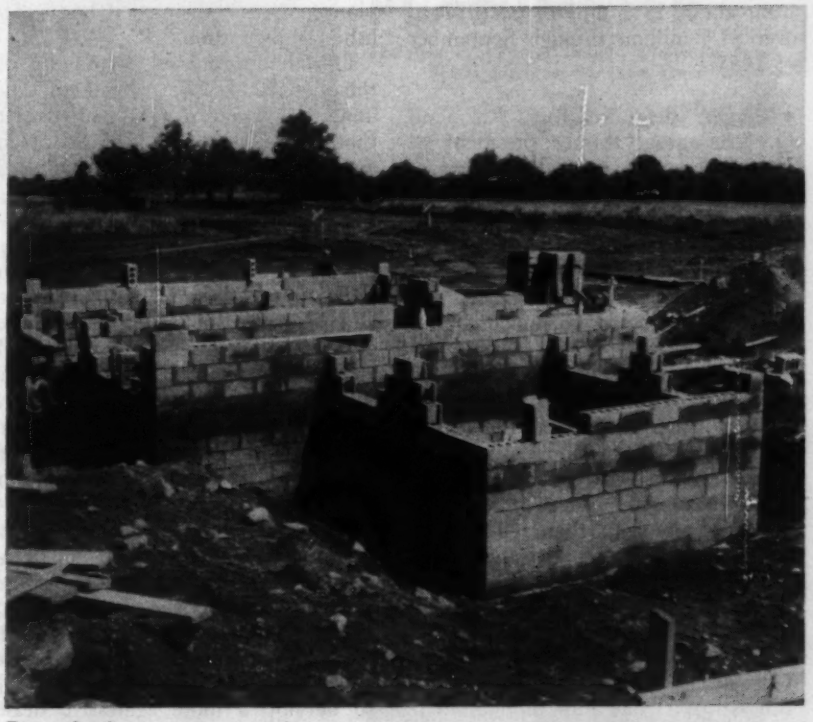
The house is brought to its new site and slowly edged over its new foundation. Then it is lowered so that the steel beams supporting it fit into spaces in the new basement wall. Later, the steel beams are removed and the spaces are bricked in. Services are connected as soon as possible.

• **Temporary homes provided**—To assist home owners who are moving, Ontario Hydro-Electric Power Commission has set aside a few houses where families can live until their electricity and other services are connected.

When the gates of the Long Sault Dam are lowered in 1958, forcing the St. Lawrence River level to rise, flooding on both sides of the river will take place. By that time four new municipalities will have been built on the Canadian side to replace the present villages.

The village of Iroquois will be moved north of the present village site. About one-third of Morrisburg will be flooded and the business section relocated east of the present community. A new municipality, still identified only as New Town Number One, will be located northeast of Farran Point to include the present villages of Aultsville, Farran Point, Dickinsons Landing and Wales. New Town Number Two will be located northwest of the present village of Moulinett and Mille Roches. These four projects will be built to accommodate populations of 1,100 each. Each town has been allocated room for expansion, Morrisburg to 12,000 persons; Iroquis to 10,000; New Town Number One to 7,000; and New Town Number Two to 3,000. Schools, churches, public buildings and commercial establishments are being relocated in the new communities under agreements with Ontario Hydro.

Road widening is an important part of the housemoving project because many of the streets were too narrow for the mammoth machines.



Foundations at new site have irregular wall heights to permit positioning of steel beams so house can be lowered directly onto new foundation.

The GM-Euclid Merger—Is it Legal?

Senate subcommittee queries Euclid's general manager on heavy buying of GM diesels, reduced purchases of Cummins

Entrance of the General Motors Corp. into the heavy-duty, earth-moving equipment industry through acquisition of Euclid Road Machinery Co. in 1953 got a thorough going-over by Senate antitrust investigators last week.

The Senate Antitrust and Monopoly Subcommittee took up the Euclid story as another phase in a special month-long "case study" of GM, being run by Acting Chairman Sen. Joseph C. O'Mahoney. The study is supposed to provide some answers for the committee in its consideration of whether new legislation is needed to cope with concentration in big industries—like steel and autos—and to check big corporations—like GM—from entering new fields of enterprise where their size will overpower smaller competitors.

O'Mahoney and his chief counsel Joseph Burns expressed some doubt as to the legality of the GM-Euclid merger. Particularly, they stressed the fact that since the merger, Euclid purchasers of diesel engines from the Cummins Engine Co., Inc., have dropped 75%. Charles R. Boll, Jr., vice president of the Cummins Co., testified that prior to the merger, Euclid was his company's largest customer. Since the Euclid Co. has become Euclid Division of GM, its purchases of GM diesel engines rose from about $1.7 million in 1952 to over $4.5 million through September of 1955.

• **Merger defended**—But Raymond Q. Armington, former president of Euclid and now general manager of the Euclid-GM Division, defended the merger. Armington said the family-owned company had grown into a market and an industry that required the resources, finances and facilities that could be provided by a larger corporation.

Armington, describing Euclid's development, said it grew from a company worth $3 million at the end of World War II to about $16 million in 1952. But with its product line limited to trucks, scrapers and loaders, Armington said that by 1952, Euclid had to get into the crawler tractor field "to grow and succeed."

He pointed out that each of its principal competitors—Allis-Chalmers Mfg. Co., International Harvester Co., and Caterpillar Tractor Co. and others—have gone into production of rubber-tired tractors and scrapers which had been principal products at Euclid. However, Euclid would have required additional capital of about $30-million to undertake production of a crawler tractor.

"It was just not in the cards to think that we could get that kind of money on our own," Armington said.

This lack of finances, together with the limited line of products and the resulting lack of a strong distributor organization, Armington said, was "putting Euclid at a serious competitive disadvantage."

• **Approached other firms**—Armington revealed he had "exploratory discussions" with two crawler tractor manufacturers in 1952—International Harvester and Allis-Chalmers—on the possibilities of joining with them. Then he approached GM, and in about six months, GM decided to acquire Euclid.

GM at that time was working on research and development in the off-the-road equipment field. GM had run an exhaustive market analysis, he said, and the "facts persuaded them to go ahead." Armington said the sales price was $18 million in GM stock, now worth about $40 million.

The best Euclid could have done alone, he added, would have been to survive in a "constantly decreasing way with the few products it had pioneered and in which it had established a reputation."

O'Mahoney pressed Armington on the details of the agreement and wanted to know if GM had insisted that Euclid use only GM diesel engines, making it a "captive customer."

Armington said that the policy is that optional motors—Cummins or GM—are still available to customers on all Euclid models in production prior to the merger—trucks, scrapers and loaders. But new products, developed after the merger with GM, are designed around the GM engine. This includes, of course, the new TC-12 388-hp crawler tractor, one of the first steps taken after the merger to broaden Euclid's line of products.

Armington explained that volume production of equipment like the crawler tractor and new scrapers required standardization on the GM engine so that Euclid products "would be competitive in price." Since the merger, he said it has been possible to develop a more aggressive dealer organization, with a more complete line of products and equipped to sell GM diesel parts at a profit. He offered this as another reason why Euclid's purchase of Cummins engines dropped off.

Prior to the merger, Euclid's dealers could not sell GM parts and after the merger, he said, Cummins has not been able to offer enough of a margin on its parts to dealers to make it practical for them to handle Cummins parts. This situation, Armington admitted, might definitely influence the dealer to favor the GM engine on those Euclid products where optional engines are available.

Hydro or Steam?

Columbia Basin studies to size up power sources

New studies of the Columbia River and its tributaries—including power possibilities—are a prime project of both the Corps of Engineers and Pacific Northwest states.

The states' probe was ordered by Washington, Oregon, Idaho and Montana during a meeting of the Northwest Governors' Power Policy Committee. The study, to be carried out by an engineering subcommittee, will investigate upstream and downstream conditions, as well as international problems of river development.

The Corps of Engineers study of the Columbia's "main stem" is designed to bring its "308 Report Review" up-to-date. The Engineers, assisted by representatives of various Columbia Basin states and agencies, will re-evaluate a flood-control plan and study a power system to be developed within the next 10 to 15 years.

The power question will be one of the major topics taken up by both studies.

The governors' own engineering committee already has reported that the Pacific Northwest needs studies of power sources to determine whether the time has come to combine steam-generated and hydro power on a large scale. The report declares that Pacific Northwest power suppliers must prepare to recognize possible advantages of fuel-hydro power combinations, and the power consumers must be adequately informed about these advantages.

Brig. Gen. L. H. Foote, speaking for the Corps of Engineers, emphasizes that the new study will not be a final review or a final plan for development of the Columbia River. "Whether we are going to develop storage or depend on thermal power hinges on the trend of events. We also shall try to evaluate the use of atomic energy from a purely engineering and economic standpoint."

After 16 months of preparation . . .

School Conference Opening Next Week

The White House Conference on Education, 16 months in preparation, goes on stage for a four-day run next week in Washington's Sheraton Park Hotel. Delegates are being told in advance the U.S. needs $25 billion worth of new school buildings in the next 10 years.

Backed by $1 million provided by Congress, the conference aim is to discuss and report to President Eisenhower on "significant and pressing problems" affecting the nation's schools.

Head and shoulders above any of the other pressing problems is the question of finance.

On the agenda for the meeting are these six broad topics for discussion by 1,400 official delegates from every state and territory:

- What should schools accomplish?
- How to organize systems more efficiently and economically?
- What are building needs?
- How to build and operate schools?
- How to get, and keep, enough good teachers?
- How to obtain a continuing public interest in education?

The aim is to provide guidance for Eisenhower in drafting an Administration school program that will go to Congress early next session. Eisenhower will get a lot of advice, but it now appears that most of it will be conflicting.

Those working on advance plans for the conference are reconciled to two reports—majority and minority—on most of the vital topics, including

(*Continued on page 32*)

Second Gandy Bridge for Traffic Relief

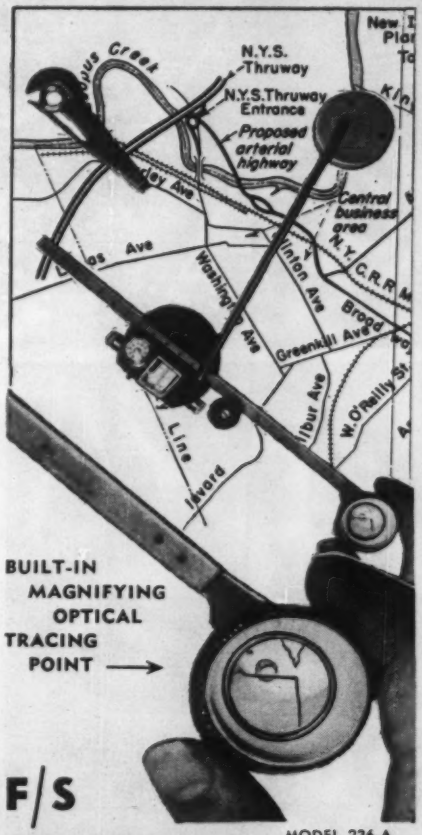
A new highway bridge across the northern arm of Tampa Bay in Florida is expected to be opened to traffic early next year in time to bring relief for the traffic congestion that develops each winter between Tampa and St. Petersburg. The new structure is 80 ft north of the present Gandy Bridge (at right), which was built in 1924 as privately financed toll project. Both structures now are owned by the Florida State Road Department. After the new highway bridge has been completed, each structure will carry traffic in one direction only.

The new bridge has a 26-ft wide roadway in contrast to 24 ft on the old structure, and a fixed high-level crossing of the navigable channel (45 ft under clearance), whereas the old bridge has a low-level bascule span that must be opened even for small boats.

As a concession to fishermen, the State Road Department is building a "fishermen's walk" that will extend 2,000 ft from each end of the new structure. The total length of the bay crossing is about 6 miles, of which 2.6 miles will be concrete trestle and bridge construction. Stringers in the new concrete trestle are prestressed, 48 ft long, of the same dimensions as those in the Sunshine Skyway trestle (ENR Feb. 26, 1953, p. 36), thus permitting use of the forms and prestressing equipment built for that project.

The Hardaway Contracting Co. of Columbus, Ga., builder of the prestressed units for the skyway trestle, is the contractor on the new Gandy Bridge.

GOODBYE EYESTRAIN!



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"Boy, that new highway sure helped us businessmen!"

Here's what happened in one Ohio town as part of that state's expanding highway program. Know how your own state is handling its traffic problem?

Ted's only ten but he's got a good head for business. So when he heard all the talk about taking the state highway off Main Street and running it out around his Ohio hometown, he paid attention. The barber argued a bypass would hurt business. Mr. Keyser at the hardware store was worried, too. Ted wondered if it was such a good idea at that.

Then the bypass was finished, and what happened? Fast-moving through traffic let the town alone and local trade found a place to park once more. Main Street relaxed: it became possible again to get a leisurely haircut, pick up those wood screws and window screen . . . and stop for a shine. And business picked up. In a town like Ted's, for example, merchants say business went up some 12% to 20% after their bypass was finished.

Bypassing villages is only one phase of Ohio's highway program. 4000 miles of road have been built or improved in the past five years. A new 326-million-dollar turnpike now links the Pennsylvania and Indiana lines. 150 to 200 million dollars will be spent each year for the next five years. That will not solve all the problems, but the traffic picture in Ohio gets brighter all the time.

Your own state has a sensible road program, too. Write your Highway Commissioner or Governor and find out what it is, if you don't already know. Study it. Then, as an informed citizen, let your feelings about it be known.

After all, it affects you as much as it does Ted. Maybe more.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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Wherever you see Caterpillar machines working on your roads, you can be sure your state is getting its money's worth.

The need for better roads

and the machines to build them

On the opposite page is a black and white reproduction of a recent full-color Caterpillar advertisement. It is one of a long series that has appeared in *The Saturday Evening Post*, *Time* and *Newsweek* since 1949, calling public attention to the sad plight of the nation's highways. The task of arousing car owners and taxpayers isn't finished. We shall continue to drive home the need for new and safer roads, confident in the skills of the contracting profession to get the job done, and in our own ability to develop equipment with which to do it.

One example of this better equipment is the new CAT* D8 Tractor, Series D and Series E. While this machine bears the name of the world's most famous crawler, it's *new* from the ground up! From its new 7-roller track frame to its new 191-HP, 1200-r.p.m. engine, it's built to deliver more production than any previous D8.

Other new features include optional torque converter or direct drive . . . up to 7.4 m.p.h. in high . . . starting from the seat, with a new, more powerful starting engine . . . hydraulic booster steering . . . "live-shaft" drive, with constant power for cable controls . . . 118-gallon fuel tank. And it's a *bigger* tractor than the former D8, with 13-inch ground clearance, greater track length and ground contact, over 20 tons of operating weight.

The D8 is yours for more production and greater profit. Your Caterpillar Dealer, furnishing prompt service and genuine parts, will be glad to show you how this *new* big yellow machine can pay off for you!

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ANOTHER EXAMPLE OF CATERPILLAR LEADERSHIP IN ACTION

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INDUSTRIAL

MODEL	CYL.	BORE & STROKE	DISPLACEMENT	HP @ GOV. SPEED	MAX. TORQUE @ RPM
ZD129	4	3¼ x 3⅝	129	34.0 @ 2000	87.5 @ 1200
GD137	4	3⅜ x 4⅜	137	39.0 @ 2000	113.3 @ 1200
ED201	4	3⅝ x 4½	201	43.8 @ 2000	143.0 @ 1100
HD243	4	3¾ x 5½	243	54.7 @ 2000	178.0 @ 1200
HD260	4	3⅞ x 5½	260	59.3 @ 2000	184.0 @ 1100
HD277	4	4 x 5½	277	63.0 @ 2000	201.0 @ 1100
JD382	4	4½ x 6	382	72.5 @ 1600	276.0 @ 1000
TD427	6	4⅛ x 4⅜	427	106.5 @ 2000	310.0 @ 1200
RD572	6	4⅜ x 5⅜	572	154.0 @ 2000	428.0 @ 1300
VD603	8	4¼ x 4¼	603	175.0 @ 2600	468.0 @ 1200
SD802	6	5⅛ x 5½	802	202.0 @ 1800	620.0 @ 1200

TRANSPORTATION

MODEL	CYL.	BORE & STROKE	DISPLACEMENT	HP @ GOV. SPEED	MAX. TORQUE @ RPM
TD6427	6	4⅛ x 4⅜	427	116.0 @ 2400	307.0 @ 1200
RD6572	6	4⅜ x 5⅜	572	172.0 @ 2400	428.0 @ 1300
VD8603	8	4¼ x 4¼	603	182.0 @ 2800	466.0 @ 1200
SD6902	6	5¼ x 5½	802	225.0 @ 2200	620.0 @ 1200

Red Seal Cushioned Power* Diesels are getting the call for more and more of the really tough jobs, not only in transportation, but in industry, in construction, and on the farm. Why? Because Cushioned Power Diesels provide ALL the advantages of the Diesel principle, with none of the drawbacks common to Diesels of conventional design. You'll be far ahead, all the way, standardizing on equipment built around dependable Red Seal Cushioned Power—or using it to replace heavier Diesels of conventional design.

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. . . School Conference

the problems of financing construction of new schools.

The committee for the White House Conference on Education recently issued a booklet, "Suggested 'Homework' for Participants," setting out some of the problems and summarizing arguments on both sides.

Among other things, the booklet presents an estimate by the committee staff that national school construction needs during the next decade will average about $2.5 billion per year, or $25 billion for the 10 years.

It arrived at the figure by "assuming that obsolete buildings should be replaced, that the rate of public school population growth will average 1,000,000 per year and that it will cost $1,000 per pupil to construct school buildings." The staff is of the opinion that its own figures are too conservative.

It feels the per pupil cost actually should be closer to $1,200. Moreover, the calculations do not take into account interest and other charges incurred in borrowing.

Authors of the booklet tried to make their views non-controversial, but their work reflects a demand for states to funnel more money into school construction.

"It is evident that the problem will be more acute in some states and districts than others, even if . . . a very big effort is made. Opinions still differ as to whether federal financial assistance will be needed to help solve this problem."

• **Building codes and prefabs**—Other comments from the booklet cover such subjects as:

• Building codes—"Assuming that building codes may be in need of revision, there is the issue of whether they should be written as guides rather than standards. . . . Many contend that the specifics tend to make the code more quickly out of date in a day of rapidly changing technology. On the other hand, one must not risk the safety and health of youth by codes that may be too lenient or too general in their requirements."

• Prefab buildings—"Prefabricated schools are without question cheaper than custom-built schools, although the precise amount of money which could be saved in this way is open to debate. . . . Architectural fees could be virtually eliminated, and there would be further savings in the standardization and mass production of structural parts (and) the cost of labor for erecting such buildings. One objection is that . . . uniformity is not usually esthetically pleasing nor educationally desirable."

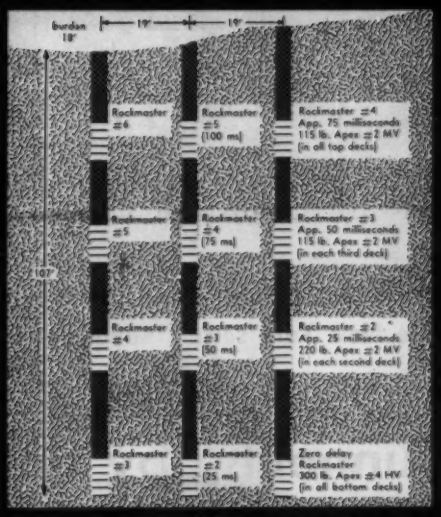
Delayed "triple deck" blast cuts air snap, vibration...*and complaints!*

MISSION: Move an 18-ft. burden off a 107-ft. quarry face. Get good breakage—but no complaints.

METHOD: "Triple Deck" each hole and shoot each deck separately with ROCKMASTER® millisecond delays. Blast initiated at bottom of each charge for maximum confinement. (Note movement at ⅓ second, lower right.)

At full second, entire burden is in motion. Toe leading . . . excellent control. Sound muffled . . . little vibration.

Low final muck pile . . . well spread. Excellent breakage . . . little work for the drop ball.


burden 18'
19'
19'
107'
Rockmaster ±6
Rockmaster ±5 (100 ms)
Rockmaster ±4 App. 75 milliseconds 115 lb. Apex ±2 MV (in all top decks)
Rockmaster ±5
Rockmaster ±4 (75 ms)
Rockmaster ±3 App. 50 milliseconds 115 lb. Apex ±2 MV (in each third deck)
Rockmaster ±4
Rockmaster ±3 (50 ms)
Rockmaster ±2 App. 25 milliseconds 220 lb. Apex ±2 MV (in each second deck)
Rockmaster ±3
Rockmaster ±2 (25 ms)
Zero delay Rockmaster 300 lb. Apex ±4 MV (in all bottom decks)

Blast uses six ROCKMASTER delay periods in three 107-ft. holes. 750 lbs. of Apex® quarry and stripping explosives loaded in separate decks in each hole

WHEN you're blasting in the middle of a heavily populated residential area, you *know* the neighbors are listening. Good public relations are a must—but so are good breakage and control!

Union Building and Construction Co., Clifton, N. J. solved this dilemma with ROCKMASTER®. Working hand-in-hand with their Atlas representative, they developed this unique method of "deck initiation." It takes *extra* advantage of all the benefits of delayed-action ROCKMASTER electric blasting.

Ask *your* Atlas representative about ROCKMASTER—the modern blasting method that gives you quiet efficiency, saves explosives, and adds a "good neighbor policy" for a bonus.

GET "BETTER BLASTING"

If you are not already getting this informative periodical, let us put your name on our mailing list today.

(P. S.—Tell us who else in your organization should get "Better Blasting", too.)

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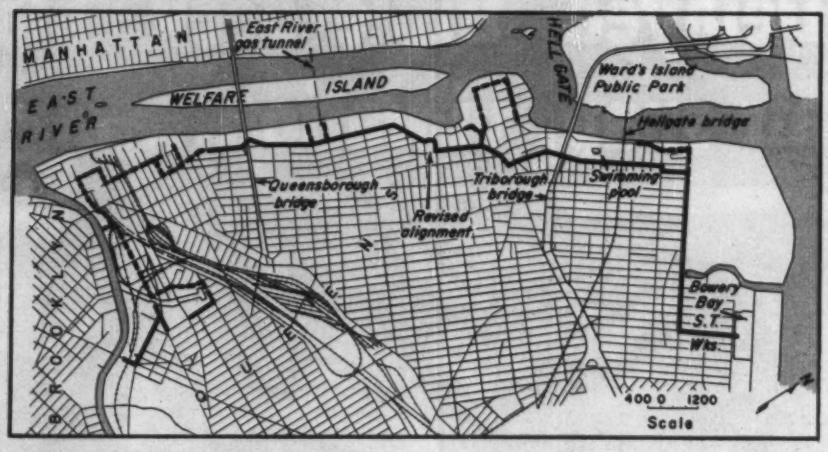


SNAKING THROUGH heavily industrialized areas of Brooklyn and Queens, tunnel will connect existing and future lines with Bowery Bay disposal plant.

Mixed up and unexpected underground conditions on five-mile New York sewer tunnel put contractor's ingenuity to test

Tunneling by the "Slog-it-Through" Method

The key to any tunneling job is what you find after you start to dig. And because you can't see what's ahead—though you can make some good guesses, sometimes, on the basis of borings and other tests—a tunnel job is among construction's biggest gambles.

Both New York City's Department of Public Works and the S. A. Healy Co., of White Plains, New York, knew these facts when Healy started work in October, 1953, on a five-mile sewer tunnel that will border the blunt northeast end of Long Island, in the city's Queens Borough.

But neither party bargained on finding things quite so mixed up as they have proved to be—rock where borings indicated it shouldn't be, earth where there should have been rock, ancient river bed filled with tightly packed gravel and boulders, and the need for working under air throughout most of the job.

As part of normal pre-bidding procedure, borings were taken. But because the route of the sewer followed street lines and interference with traffic and underground structures had to be avoided, the borings could not be made along the center line of the sewer. They were made as close as possible in the sidewalk area on the general assumption that variations in subsurface conditions would be minimal at points relatively close to each other. However, in this case, the general assumption did not hold. Wide divergence from the bore data was found.

When these facts are added into the expected difficulties of passing under three of the city's major bridges, crossing over a subway line and over and under the usual big-city tangle of utility and service lines, the total is a difficult, complex project.

• **Big job, small size**—The Healy contract—with a little more than a year of tough tunneling work to go—is a major portion of an overall $110-million program to improve sewer service to a vast area of Queens, and to improve pollution conditions in waters surrounding New York City.

With a $14-million remodeling scheme that will more than double the capacity of the Bowery Bay disposal plant (ENR May 12, p. 49), the new system will connect with collecting sewers throughout the heavily industrialized area of northern Brooklyn and western Queens, delivering at capacity, 120 mgd of raw sewage.

The tunnel itself is comparatively small in size—the finished diameter increasing in stages from 60 in. at the southern end (just south of the Queensboro Bridge) to 96 in. in the final section that will connect it to the sewage plant. But the 24,480-ft length makes it one of the longest tunnels of its type in the city, and by far the longest ever let as one piece by the city's Department of Public Works.

Its depth below ground level (at invert line) varies from 30 ft at the southern end to 70 ft in the mid-section, to 45 ft at the Bowery Bay plant.

The test borings made for the city, at approximately 1,000-ft intervals along the proposed route, indicated that good rock cover would exist for much of the distance. The rock, however, was expected to dip below the proposed tunnel grade for some distance west of the disposal plant, so that some air work was to be expected. The rock itself is the typical rock of the area—Manhattan schist and granite diorite.

• **Rock—and no rock**—With this information, plus some further data from test borings of its own, Healy moved a crew into the city early in October of 1953 and went to work, intending to operate from four shafts, mining from them in both directions.

At the south end of the contract, Healy subcontracted the first 3,500 ft (a presumed rock section) to Thomas Adair Contracting Corp. of New York. Adair's crew went to work in rock, but soon encountered a mixed face of half rock, half gravel, boulders and sand. (Before completing its work, Adair had two such sections—one under busy Vernon Boulevard, the other below Queensbridge Park.)

Tunnelling under these conditions—considering the narrowness of the bore itself and the bad ground conditions above—was believed to be impractical, so these sections were finally built as open cut trenches, 35 ft deep. This was no easy trick in itself, since numerous cables, conduits, sewer and water lines and other utilities beneath the park and the streets had to be suspended over the cut, and local traffic had to be rerouted.

At another spot—beside the ap-

Part way through the 705 foot rock section on the New Jersey side.

THEY'RE AVERAGING 630-FEET PER ROD

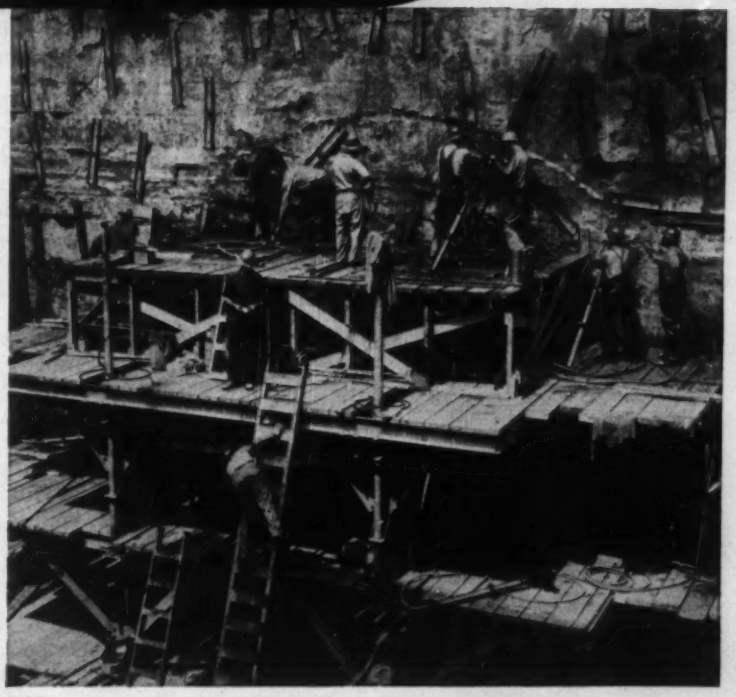
with

CRUCIBLE alloy hollow drill steel...

When completed the third tube of the Lincoln Tunnel will speed vehicular traffic between New York and New Jersey under the Hudson River.

On the New Jersey side construction involves tunneling through 705 feet of rock, and moving 24,000 cubic yards of trap-rock and sandstone. For this big job the contractors, Mason Johnson MacLean, chose Crucible CA Double Diamond alloy hollow drill rods. It proved to be an excellent choice, for in drilling 108,500 feet of hole, Crucible alloy drill rods gave an average of *630-feet per rod.*

There's good reason for this *extra* performance. For Crucible alloy hollow drill rods are made to *tool steel standards,* by the nation's leading producer of tool and other special purpose steels. You can count on longer rod life . . . fewer broken rods . . . *lowest cost per foot of hole drilled* . . . when you specify Crucible alloy hollow drill rods. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*



Drilling starts on the third tube of the Lincoln Tunnel.

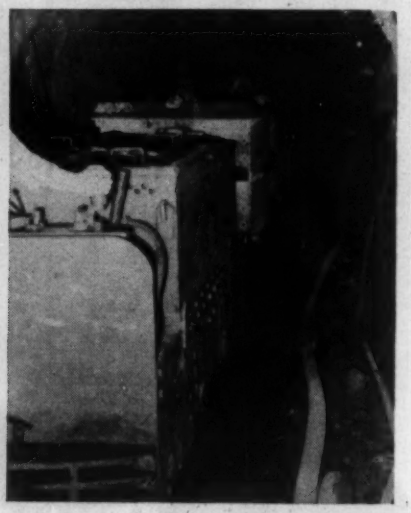
CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

For Mucking out . . .

SHOVEL LOADER discharges into car behind it, or . . .

CONVEYOR BELT, is loaded by hand for discharge into cars of . . .



ELECTRIC DINKY TRAIN which hauls cars to shafts for unloading

proaches to the Triborough Bridge—Healy's crews found rock for about 500 ft, then ran into a mixed face, then back into rock, then into a full earth face, then into rock again—but rock whose top would have provided in some places less than a foot of cover over the tunnel.

As a matter of fact, although some 18,000 ft of the tunnel now is excavated and lined with concrete, to expect the unexpected has become almost a job motto.

• **Slog it through**—When you hit such conditions, there's nothing to do but "slog it through" by any method that's practical.

Problems like these arise: You're going along through rock (back at the start of the job) and you hit an earth face about as predicted. So you spend three days maneuvering a pocket-sized conveyor belt setup down the narrow shaft and through the twisting, narrow tunnel to the heading—figuring the time is well spent for the added speed of getting rid of the muck.

But, two days after your belt is working—you run out of earth and into the rock again. There's nothing for it but to spend another day getting the conveyor out again, running your tiny mucking machine back into the heading and going back to blasting.

Your working face is pretty small anyway—at the largest, the excavated diameter of the tunnel is only 11 ft—and you're lucky if you can get as many as three men at a time to work at the heading. And when you're in a mixed face, or a full earth face that consists largely of boulders, the only answer is clay spades—and human hands and muscles to pick out the boulders almost one by one.

At one spot the tunnel passes about 500 ft east of, and well below, one of the city's largest swimming pools (in Astoria park). The swimming pool suddenly develops real geysers in its bottom. Investigation shows that some of your air is escaping from the tunnel, and somehow finds its way through gravel strata to the bottom of the pool, where holes have been cut to take groundwater pressure off the structure. The remedy: You try your best to plug the tunnel—and the city has to patch the pool.

At another point you cross under the massive old Queensboro Bridge—but just over the twin-track tube of the city's BMT Astoria subway line. Here you're in rock—yet you have to shoot your holes with a quarter-stick or less of dynamite, and virtually pick out the resulting few pieces of shattered rock by hand.

Because you don't trust the uncertain cover above you, you rush to concrete the tunnel as fast as you can—using steel forms where possible, and hand-built ones where the space is too small.

You've been both lucky and your careful safety program has paid off. So far there have been some accidents—men trapped when fire broke out in one heading, and again when a drill steel struck a small piece of unexploded dynamite, things like that—but no fatalities. Careful medical attention, a fully-equipped field hospital, on-the-job precautions have helped a lot.

• **Construction procedures**—In full-rock sections steel roof supports, with steel lagging or liner plate lagging and wood blocking were used where necessary for support until concreting could be completed.

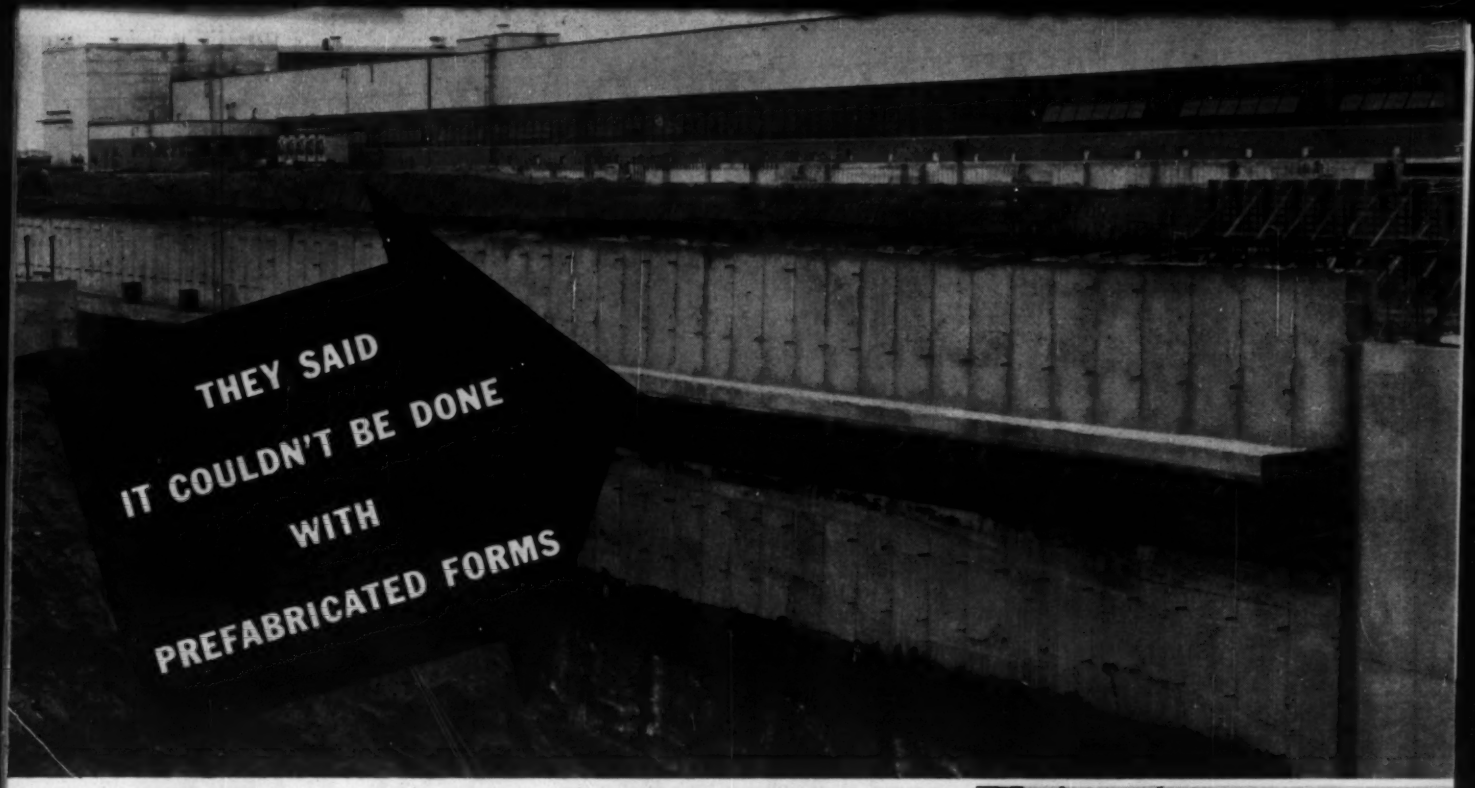
In mixed-face or full earth sections, conventional—though small-size—tunnel lining procedures are being followed. Temporary support rings are placed as rapidly as possible as the face advances, to be followed by curved, rectangular liner plates of ¼-in. steel, 36 x 16 in. in size, which are bolted together to form complete rings.

All concrete—designed for a 3,500 psi strength (a 6-bag mix) is supplied by transit-mix trucks to concrete pumps on the ground surface, and pumped through 6-in. pipes down to the tunnel level, where the combined forces of the pumping and of vibrators is used to insure complete filling of the space between the forms and the rock or liner plates. Grout—a one-to-one mix or richer—is placed behind the concrete lining as soon as practical.

In rock sections, the concrete is placed to an average thickness of 11 in. all around, in earth or mixed-face sections thickness averages 16 in.

For tunnel haulage, Healy has settled on battery-powered dinkys to pull the muck cars, operating on 24-in. gage tracks in the narrow confines of the tunnel. The rolling stock includes 16 engines that seem just big enough to provide a seat for the operator, and as many as 200 muck cars varying in capacity from ¾-yd side-dumps to 2 yd bottom dumps.

Regardless of how the cars were de-



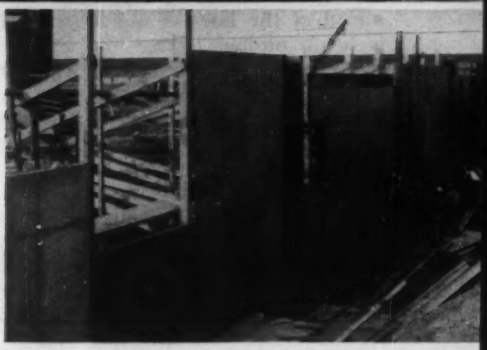
"Oh yes it can!" said Darin & Armstrong Detroit contractors..."with Atlas Compo Forms!"

There was plenty of reason to doubt that prefabricated forms could be used to pour the huge addition to a Michigan automotive plant. The job included battered walls with a big haunch; walls that had to be poured against an existing structure; and forming that had to be half completed before ties could be inserted.

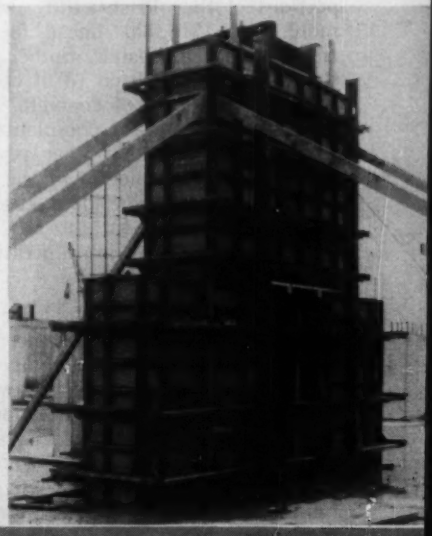
But Darin and Armstrong carefully studied the job requirements and decided Atlas Compo Forms offered the very best way to handle all problems and get the job's 60,000 yards of concrete poured within contract time.

Result: the job progressed smoothly and on schedule from the very beginning. Even the trickiest parts of the forming were done in stride.

Whenever you have a job when repeated-use forms might be used, confer with Irvington engineers. They probably can save you time and money.



So much steel reinforcement went into this wall that form ti had to be inserted *after* both sides of the forms were up. Wi the exclusive Compo tying system this readily can be don



Y-shaped piers 17' high, formed with Atlas Compo form sections and steel channel yokes, were poured continuously. 90% of internal tying eliminated. Stripped forms crane handled in large units eliminating reassembly.

IRVINGTON FORM & TANK CORPORATION

DEPT. EN 24 20 VESEY STREET NEW YORK 7, N. Y.

signed to unload, by the way, Healy handles them all the same: The engines haul them to the shafts, crawler cranes lift the cars bodily to ground level and dump them into trucks for disposal under a subcontract.

Other equipment on the job includes 14 muckers of varying sizes; a job-made (and somewhat pocket-sized) jumbo carrying three drifters; air equipment capable of supplying, at peak, 30,000 cu ft per minute of low air and 15,000 cu ft per minute of high air; plus numerous drills of all sizes, clay spades, air-driven hammers and saws. Healy maintains repair and carpenter shops and a small complement of trucks and other surface equipment.

At peak periods, the contractor and his subcontractor have had as many as 750 men working on the project in three shifts. At present, about 500 men are employed. Highest air pressures under which sandhogs have worked, to date, is 21 psi.

• **End of the line**—While the tunnel is being pushed toward the Bowery Bay plant, a major remodelling job is under way at the plant itself. J. Rich Steers, Inc., under a $14-million contract, is more than doubling the size of the existing installation.

The work includes installation of four new, 80-ft dia reinforced concrete digesters, four 70-ft dia storage tanks; preliminary, final and aeration tanks that will cover an area of more than 142,000 sq ft; new sludge and storage tanks; and removing and replacing almost all the existing machinery, pumps and the like in the plant.

The work includes underpinning portions of the old structure; driving more than 510,000 linear feet of treated and untreated timber and steel piling; 183,000 cu yd of excavation; 52,000 cu yd of concrete. Present schedules call for completion of this work in about another year—to coincide with completion of the tunnel. Leo Magid is resident engineer on the plant work for the city, and Clayton O'Connell is job superintendent for the contractor.

• **Design and personnel**—The entire project was designed by engineers on the staff of the New York City Department of Public Works, of which Frederick H. Zurmuhlen is commissioner and William A. O'Leary is director, division of sewage disposal. Frederick Drexel is project engineer for the tunnel, and Henry Vermont resident engineer.

For S. A. Healy Co., R. J. Hill is executive vice-president; Mark A. Foote is project manager, and Gail B. Knight is project engineer.

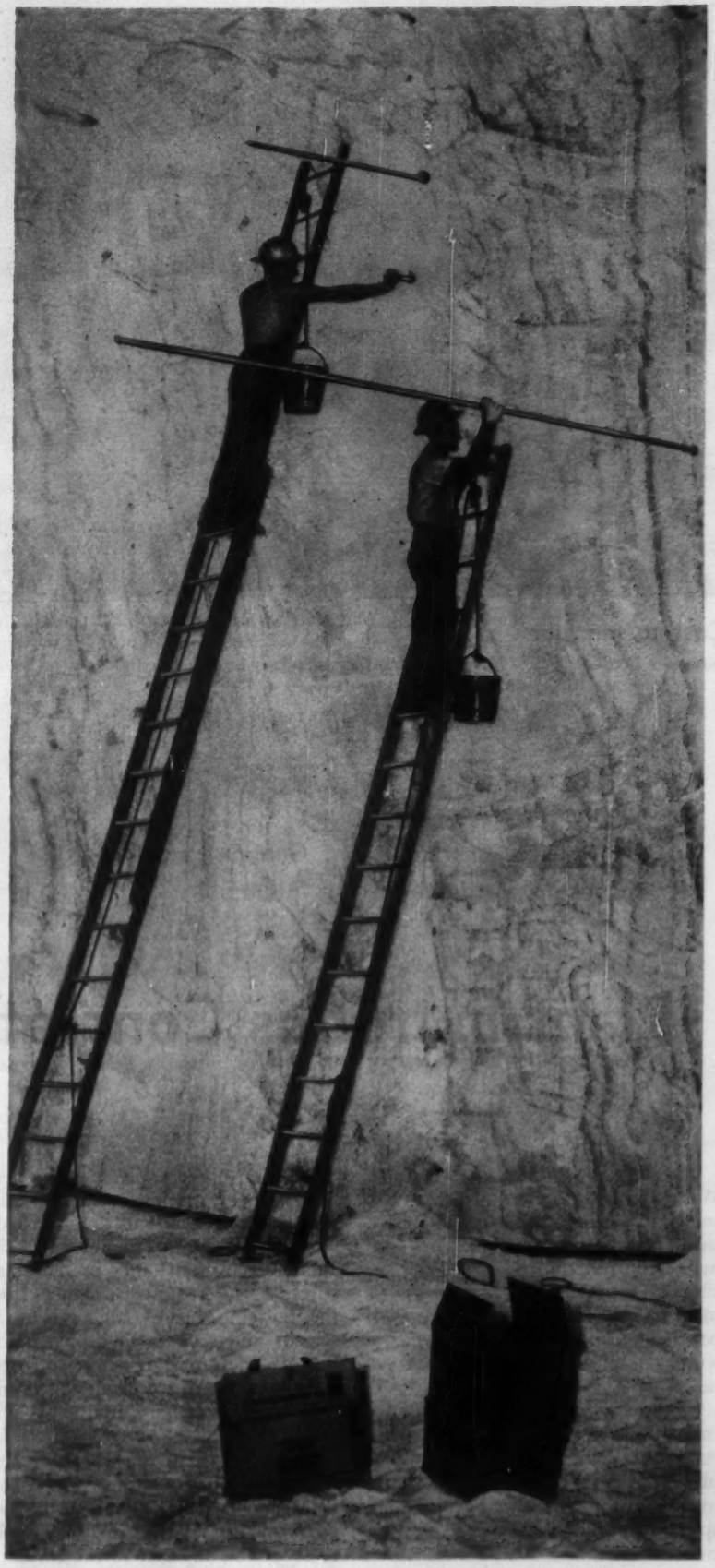
ENTRANCE TO AIR LOCK suggests the cramped working space up ahead. Battery-powered electric dinkys haul muck trains.

JUMBO MOUNTS JIBS for drills and form setting. Rig was job-built to suit small diameter of tunnel, is one of two in use.

END OF THE LINE will be Bowery Bay disposal plant, where capacity is being tripled. This is one of two beds of equal size now under construction.

Mining Rock Salt 1000 Ft. Underground

WHERE EXPLOSIVES RESEARCH PAYS OFF



Using ladders, the blasting crew loads cartridges of Hercomite® into the upper rows of drill holes in a 24-ft. high working face 1,000 ft. underground in Jefferson Salt Company's mine in Louisiana.

Primed with regular and short-period delay electric blasting caps made by Hercules, the blasts produce excellent fragmentation, affording economical recovery by power shovels and uninterrupted processing operations in the plant on the surface.

The development, manufacture, and use of specialized types of explosives have been Hercules' business for over forty years. Our knowledge of explosives and blasting techniques is at your disposal in solving blasting problems in mining, quarrying, construction, or wherever explosives are used.

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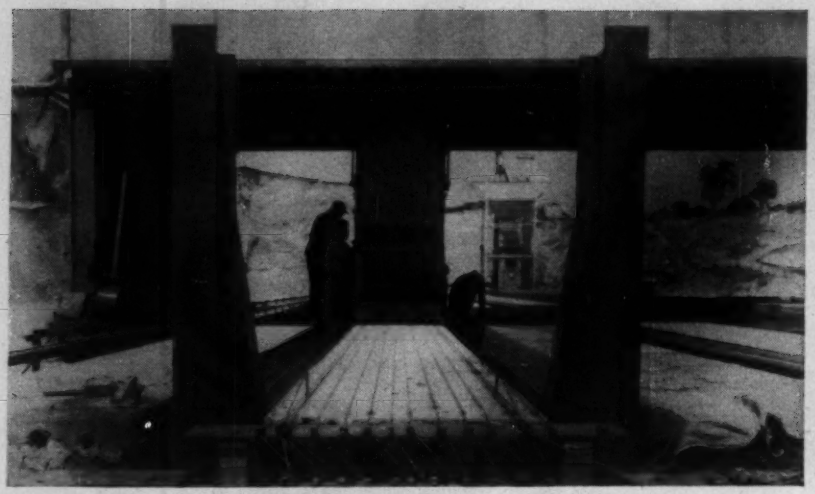
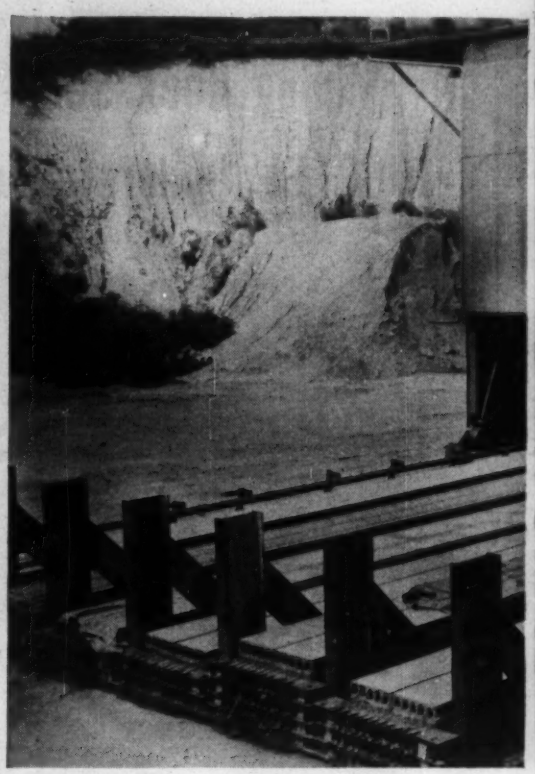
XR55-6



Casting machine hung from a moving gantry crane extrudes a stiff concrete for floor or roof planks. The machine carries slip forms; no other forms are needed. Wires for prestressing the slabs pass through a templet at the front.



Gantry crane that supports extruder moves on rails at speeds up to 4½ fpm. At the end of

Continuous casting with German machine speeds up precasting in U. S. plant.

Plant Extrudes Concrete for Prestressed

A process now in use in Waukesha, Wis. produces concrete planks like toothpaste being squeezed out of a tube. Recently imported from Germany, the new process makes it possible to extrude up to 4½ lin ft per min of prestressed roof and floor panels. Slabs can be produced in widths of 20 or 40 in. and in thicknesses of 4, 6, or 8 in.

The method by which the unit, called Spancrete, is produced is ingenious. It is cast in a continuous plank 330 ft long by means of a slip form built into a gantry crane that spans the casting beds. The slip form casting machine can be positioned to place concrete to the desired thickness on any one of six parallel casting lanes. After the six passes, it can repeat the operation casting the second batch on top of the first.

As the concrete plank is formed, the casting machine automatically shapes out tongue and groove edges, vibrates and tamps the material, accurately positions the pretensioned wires at the required distance from the bottom of the slab, and finally screeds and trowels the top surface. Since a no-slump concrete is used, there is no need for fixed side forms. Dimensional accuracy attained is plus or minus ⅛ in.

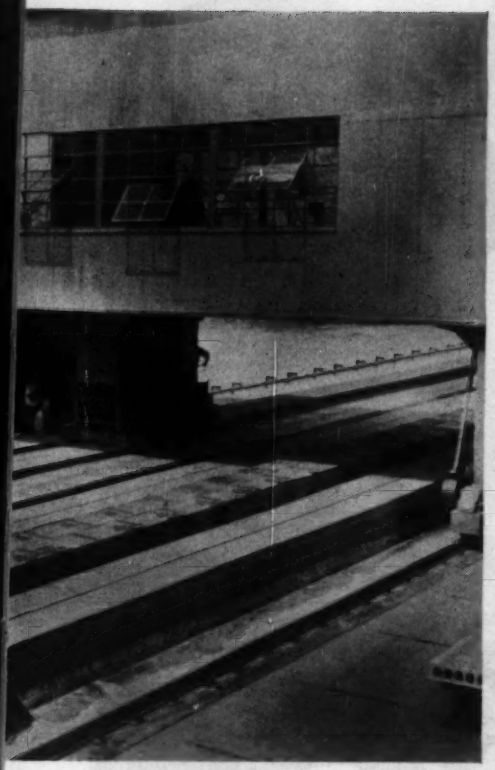
Dead weight of the panels is kept to a minimum by using hollow-core construction and a lightweight concrete mix in those portions of the cross section adjacent to the cores. A 6-in.-thick slab weighs 45 psf.

In order to obtain this lightweight slab, the machine has been designed to simultaneously feed two different mixes to form a varied density concrete. The top and bottom surfaces of the panel consist of a dense concrete (natural sand aggregate), while the region around the hollow cores is made of a lightweight concrete (slag aggregate).

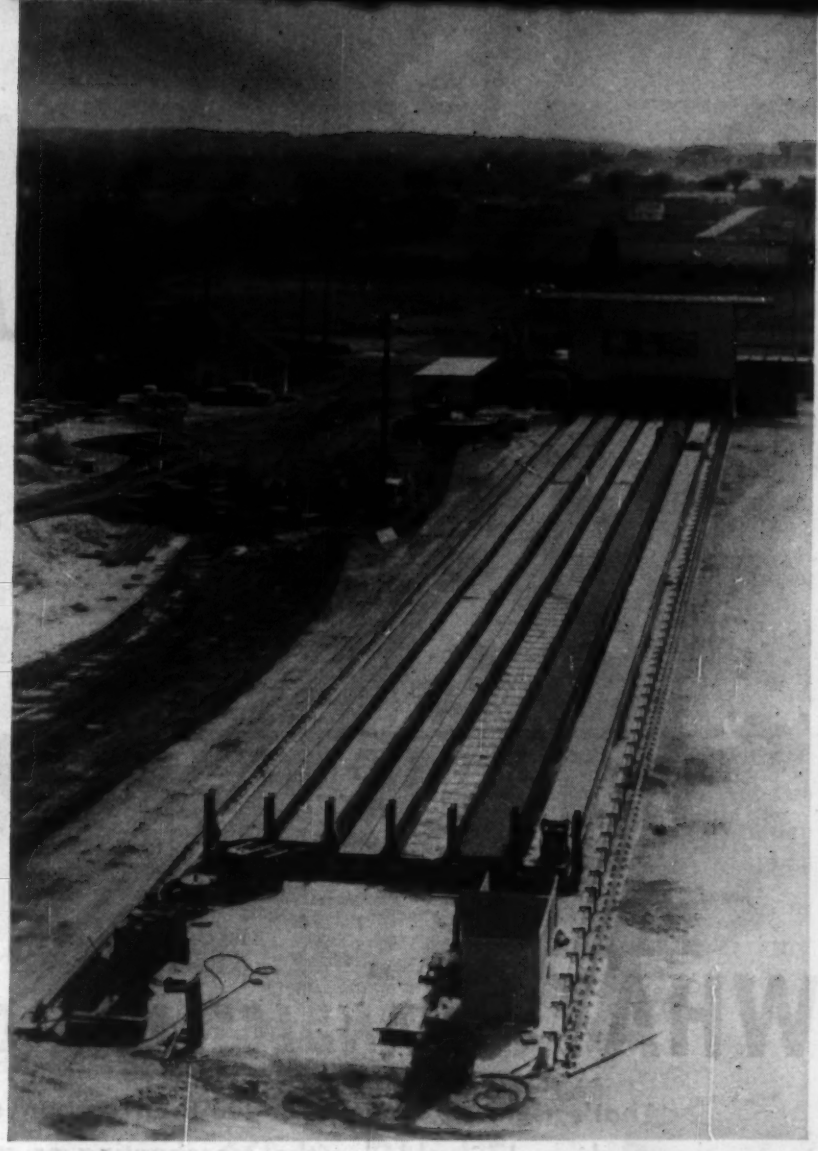
To accomplish this variation, the machine has been equipped with three hoppers positioned in tandem above the casting lanes. The front and rear hoppers are charged with the dense mixture, while the center is loaded with the lightweight.

A fork-lift truck carries the mix from a mixing plant to the moving casting machine. An overhead monorail hoist in the gantry picks up the bucket and positions it over the casting machine hoppers for discharging.

The prestress is provided by cold-drawn 0.120-in. 2-wire twist, stressed to an initial tension of 140,000 psi.



each pass the extruder is shifted to the next bed. Either 40-in. or two 20-in. planks may be cast per bed.



Six casting beds, 330 ft long, make up the plant. It takes an hour and twenty minutes to cast one plank, and an eight-hour day is needed to cast one plank on all six beds. Each day's output is cast directly on the previous day'

Precast Slabs

This is done by anchoring each wire at one end of the bed and then attaching it to a prestressing device located at the opposite end. There can be put up to 18 pairs of tendons in a 40-in. plank. For erection stresses there are 0.25-in. dia steel wires in the top of the slab.

With 11 cu yd of slab extruded per hour, it takes about one hour and twenty minutes for the machine to cast a 330-ft plank. Thus, all six beds will be cast in an eight-hour day. The next day's output is cast directly on the previous day's planks until the 5-ft height of the anchor posts has been attained.

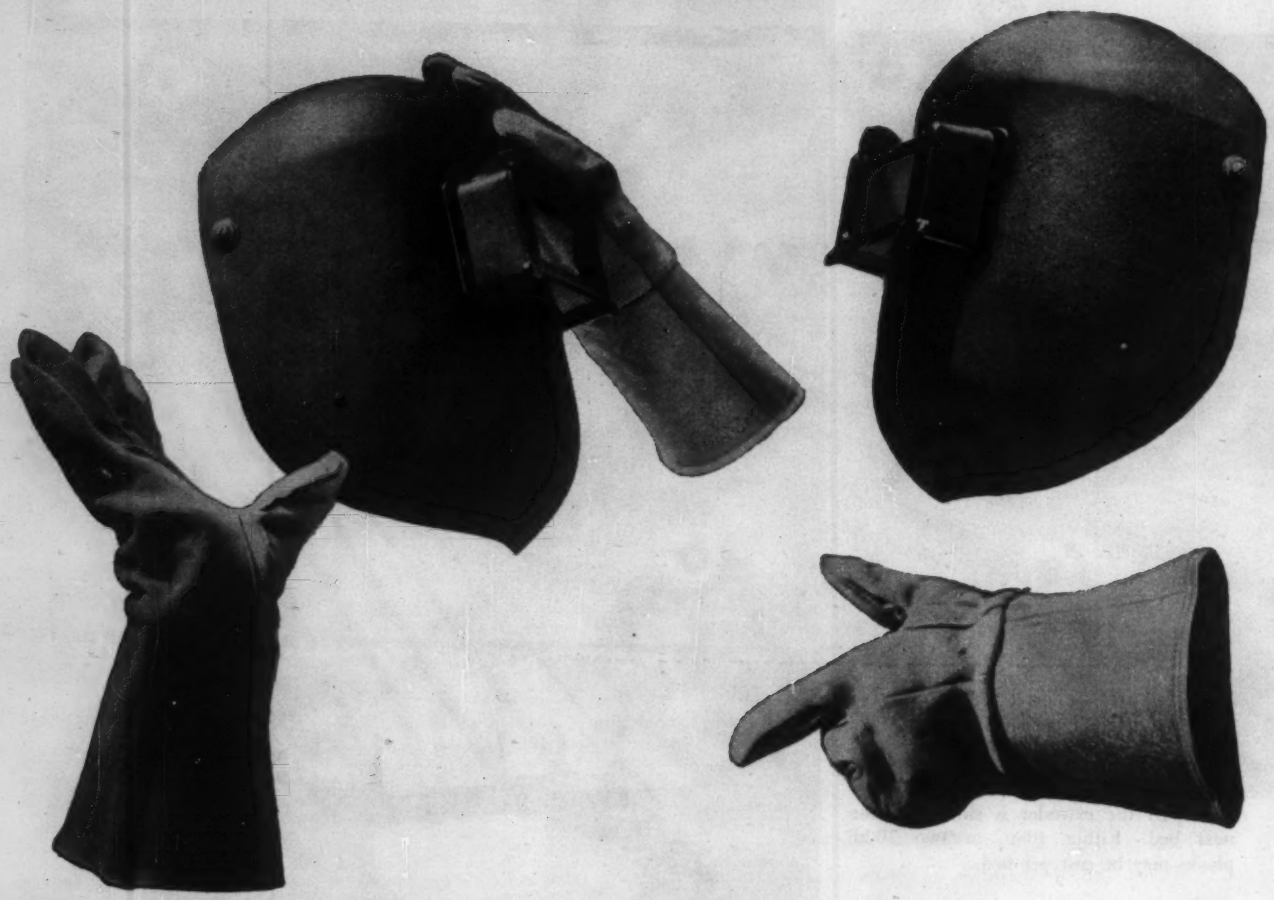
The pretensioned wires are not cut loose from the anchors until 6 days after the concrete is poured. During this period, the units are cured by covering with wet burlap.

Once the wires have been released, the 330-ft planks are cut into the desired lengths using a special masonry saw.

Tests of Spancrete indicate that the surface concrete, containing 800 lb of cement per cu yd, attains a strength of 4,000 psi in 5 days, and goes well over 7,000 psi at 28 days. Six-inch-thick slabs containing 18 prestressed wires, and having a clear span of 24 ft will carry a safe load of 50 psf.

The Spancrete process was brought to this country by the West Allis Concrete Products Co. In addition to producing slabs for marketing in the Milwaukee area, the firm has obtained patent assignments for the purpose of introducing the process in other sections of the country.

Completed planks are cut into desired lengths with a masonry saw that rides on the plank. Bonded wires hold prestress.



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In addition to easy fabrication, Lukens "T-1" steel has other benefits of equal value to equipment builders. Three times stronger than carbon steel, this new steel has lighter weight and reduced thickness in comparison to heavier, thicker plates of carbon steel, thereby reducing material, fabrication and shipping costs. Lukens "T-1" steel's excellent resistance to the combination of wear and impact abuse lowers maintenance and replacement costs, lengthens equipment life. Lukens' range of steel plate sizes—including the widest and heaviest plates available anywhere—makes possible additional savings for builders through the use of wider plates that require fewer welded seams.

A new addition to Lukens' complete line of carbon, alloy and clad steels, this new steel's unusual combination of properties suit it especially to applications in pressure vessels, bridges, shipbuilding, construction machinery and general industrial equipment. On problems of design, material selection, application and fabrication techniques, Lukens offers full technical assistance. If you would like further information on Lukens "T-1" steel, write to Manager, Marketing Service, 774 Lukens Building, Lukens Steel Company, Coatesville, Pennsylvania.

LUKENS "T-1" STEEL

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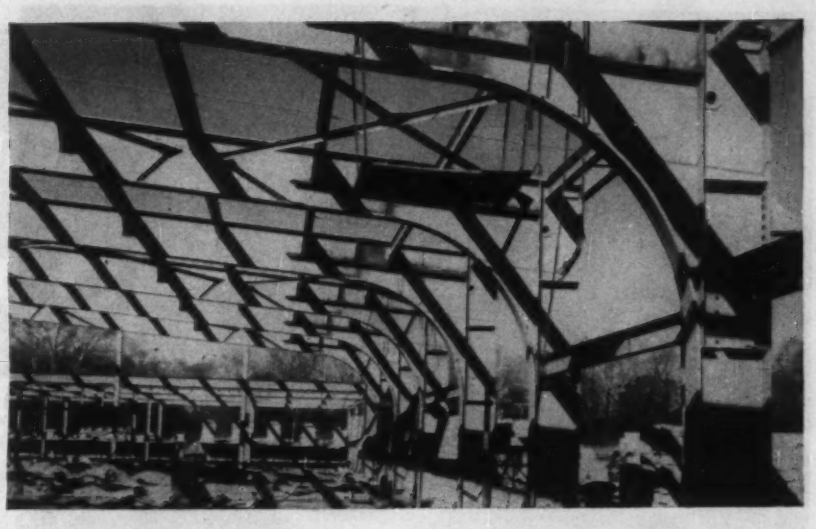
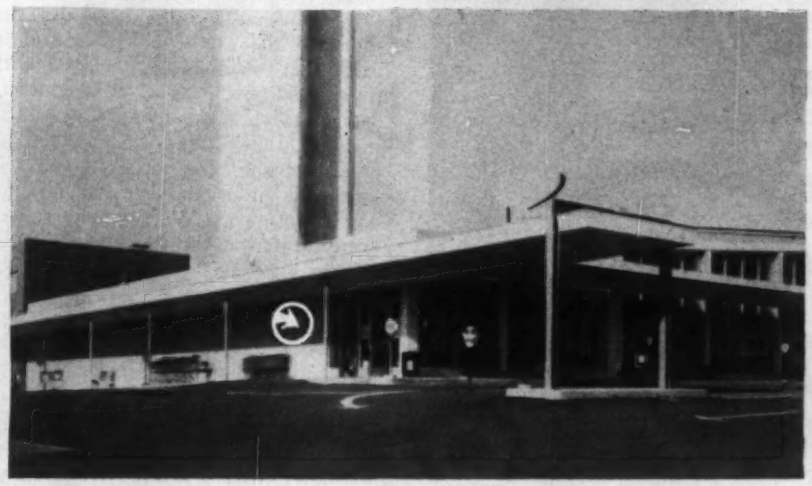
THE NEWEST IN A COMPLETE LINE OF ALLOY STEELS

LUKENS STEEL COMPANY, COATESVILLE, PENNSYLVANIA

Architects requested . . .

. . . . that this steel framed building provide a clear span of 130 ft with rigid-frame steel exposed as much as possible. Hidden bracing was the key to the solution.





Result . . .

. . . . Architects and owner are pleased with the clean-cut lines of the finished product — a new food store at Bala Cynwyd, Pa. Arrow points to exposed steel legs of the frames.

Exposing Steel for Appearance Affects Rigid Frame Design

Stewart C. Barnett
Structural Engineer
Camden, New Jersey

The architects for a new food store at Bala Cynwyd, Pa. gave the structural engineer an interesting assignment when they asked for:

- A clear span of 130 ft, using rigid frame steel construction.
- Steel to be exposed as much as possible for architectural effect.
- But web stiffeners, sway frames and knee braces were not to be visible in the knee or lower half of the girder.

The building frame consists of six welded rigid frames spaced 21 ft 8 in., with a height at the center of 24 ft. Bolted between the frames are 12-in. steel purlins that carry tees which, in turn, support a 3-in. gypsum slab roof.

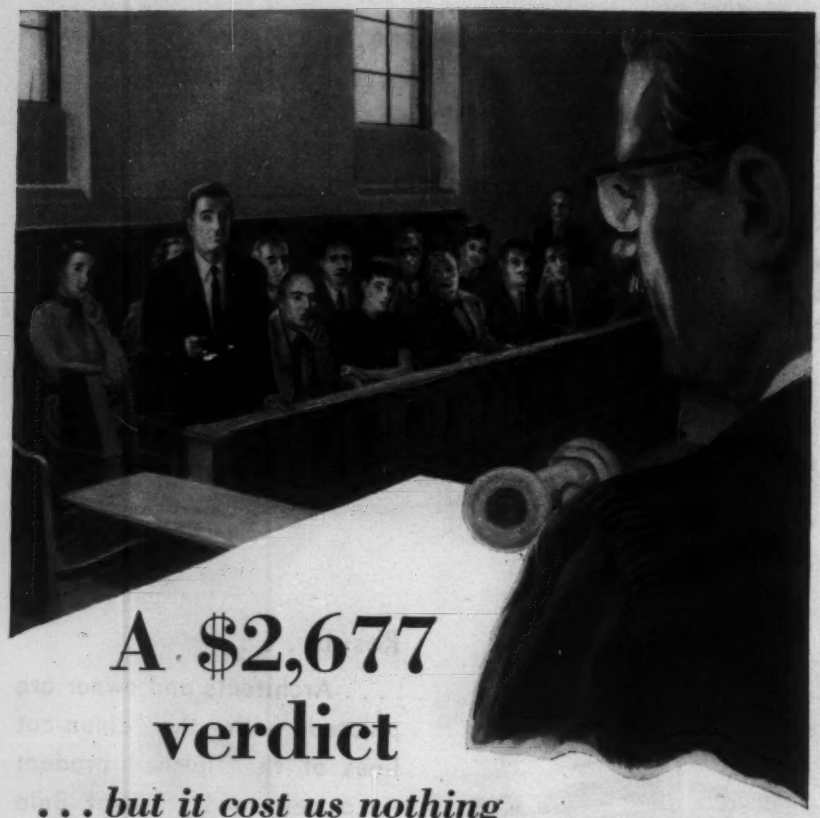
To achieve the desired architectural effect of exposed steel, neither the inside nor outside flanges of the legs of the rigid frames are encased in the exterior walls and, in addition, the lower halves of the girders are allowed to project below the plaster ceiling. To enhance the overall appearance, it was desirable that the inside flanges of the legs and the bottom flange of the girder of each frame be continuous in a smooth curve. This posed a small design problem since calculations called for a 36-in. wide-flange section for the girder while, for space purposes, only a 30-in. section was wanted for the legs. And the flanges of these two rolled sections have different widths.

The problem was solved by using 36 WF 194 sections for both the girder and the legs, but by cutting back the leg sections to 30 in. and replacing their inside flanges by a 12 x 1½ in. plate. A curve of 8-ft 6-in. radius serves as the transition from the legs to the girder which is formed of two 36 WF 194 sections inclined 1 in. per ft to a ridge at the center where the sections are joined by a field weld. To prevent the curved flange from buckling, the web plate of the knee was made 1-in. thick and three sets of triangular stiffeners, 3 x 4 x ½ in., were placed at strategic points along the curve of the flange.

The main difficulty in the design was the elimination of visible sway frames, braces and web stiffeners from the knees of the frames. This was overcome by placing a single horizontal stiffener high enough on the web of the knee so that it would be hidden by the ceiling, and extending it out several feet into the web of the girder. The stiffener is made up of 6 x ½-in. flat bars welded each side of the web.

A vertical pair of longitudinal stiffeners, consisting of 6 x ½-in. flat bars, were also used in the center of the column. These are connected at top and bottom to the other stiffeners and are set back of the plaster line so as to be hidden.

Further rigidity in this region was obtained by welding brackets under



A $2,677 verdict

. . . but it cost us nothing

(Based on Company File #71L8540)

One of our men had been injured while doing a contract job we handle for a public utility company. It was months before he could work again.

Of course, he got Workmen's Compensation. But, not satisfied with that, he sued the utility company for $25,000 damages.

The court awarded him $2,677, which the utility's insurance carrier paid. *And then we got a surprise.* The utility's insurance company sued *us* to recover the money! Their claim was based on a "hold harmless" clause in our contract with the power company.

They won their case. The verdict could have cost us $2,677 plus considerable legal expense. However, our Hartford Agent had been careful to write our Liability insurance to include proper coverage for contractual liability exposures.

That's why we had no problem. The Hartford Accident and Indemnity Company handled the whole situation for us. They defended the suit . . . paid the loss . . . met all legal costs.

Unusual and complex phases of insurance constantly crop up in today's business relationships. You have to be prepared for them.

Make it a point to have your Liability insurance requirements handled through a thoroughly experienced insurance agent or broker. He will be alert to such technical angles as contractual liability exposures. *And he will wisely place your policies in a company experienced in providing Liability protection in all its varied forms.*

For competent, dependable insurance service, see your Hartford Agent. Or tell your insurance broker you want *Hartford* coverage.

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the two purlins that join the frame near the knee thus deepening their connections.

The critical point on the rigid frame is 2 ft above the lower point of tangency of the curved flange. To take the place of omitted sway frames here, longitudinal struts of 12 WF 27 sections were framed in near this point between alternate frames.

The horizontal reaction from a total load of 60.6 psf, amounting to 98,500 lb for each frame, is resisted by two tie rods under the floor. It was specified that $1\frac{7}{8}$-in. dia rods upset to $2\frac{1}{4}$-in. dia at the thread be used, but as there were no shops in the vicinity equipped to upset rods of this size, threaded ends of the required size were welded on. The rods had been ground to a point, at a 60 deg bevel, before welding. A sample of this weld was tested to failure, and the sample did not break at the weld, but in the rod itself. The tie rods were coated with pitch and set in sand in a concrete trench to allow for elongation.

Each rigid frame was erected in four sections—two sections of the overhead girder plus the two leg-and-knee sections. Welded-field splices were located at the top tangent point of the knee and at the centerline of the building.

Two 15-ton cranes were used for the erection which began with setting the legs. These were bolted to the foundation and temporarily supported by an 8 x 8-in. wood shore under the overhanging knee. Next, the two halves of the top girders were hoisted into place with the ends at the building centerline supported on a steel shore—an 8 WF 31. Several purlins were next bolted into place for bracing, and the field splices tack welded.

Tie rods were then installed, the remaining purlins erected and bolted, and the bracing lifted into place and fastened with rivet bolts. With all the components in position, the field splices were welded, and the tie rods taken up as much as the slotted holes in the anchor bolts would allow.

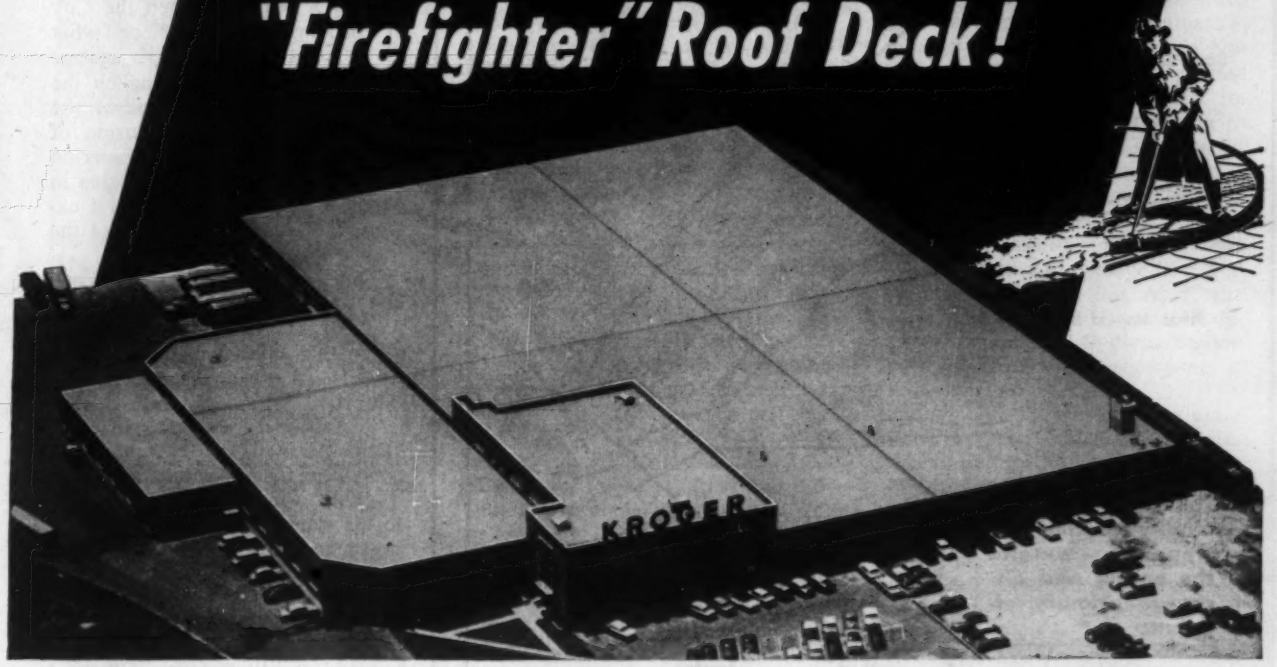
The final step was the burning out of the center shores. Instead of sagging, the frame rose about $\frac{1}{8}$ in. in the center when released.

The weight of each arch was 22 tons. The calculated elongation of the tie rods under maximum live load was 0.54 in.

Owner of the building is the Penn Fruit Co. with Sydney Elkman, the general contractor. Steel fabrication was by the F. M. Weaver Co. of Lansdale, Pa., and steel erection by Ralph Cornell Erecting Co., Woodbury, N. J.

The author was the structural engineer. Architects were Thalheimer and Weitz of Philadelphia.

8 million pounds of food protected by Gold Bond "Firefighter" Roof Deck!



Kroger Warehouse, Charleston, West Virginia; *General Contractor:* Rust Engineering Co., Pittsburgh, Penna.; *Roof Deck Applicator:* Hoge-Warren-Zimmerman Co., Cincinnati, Ohio.

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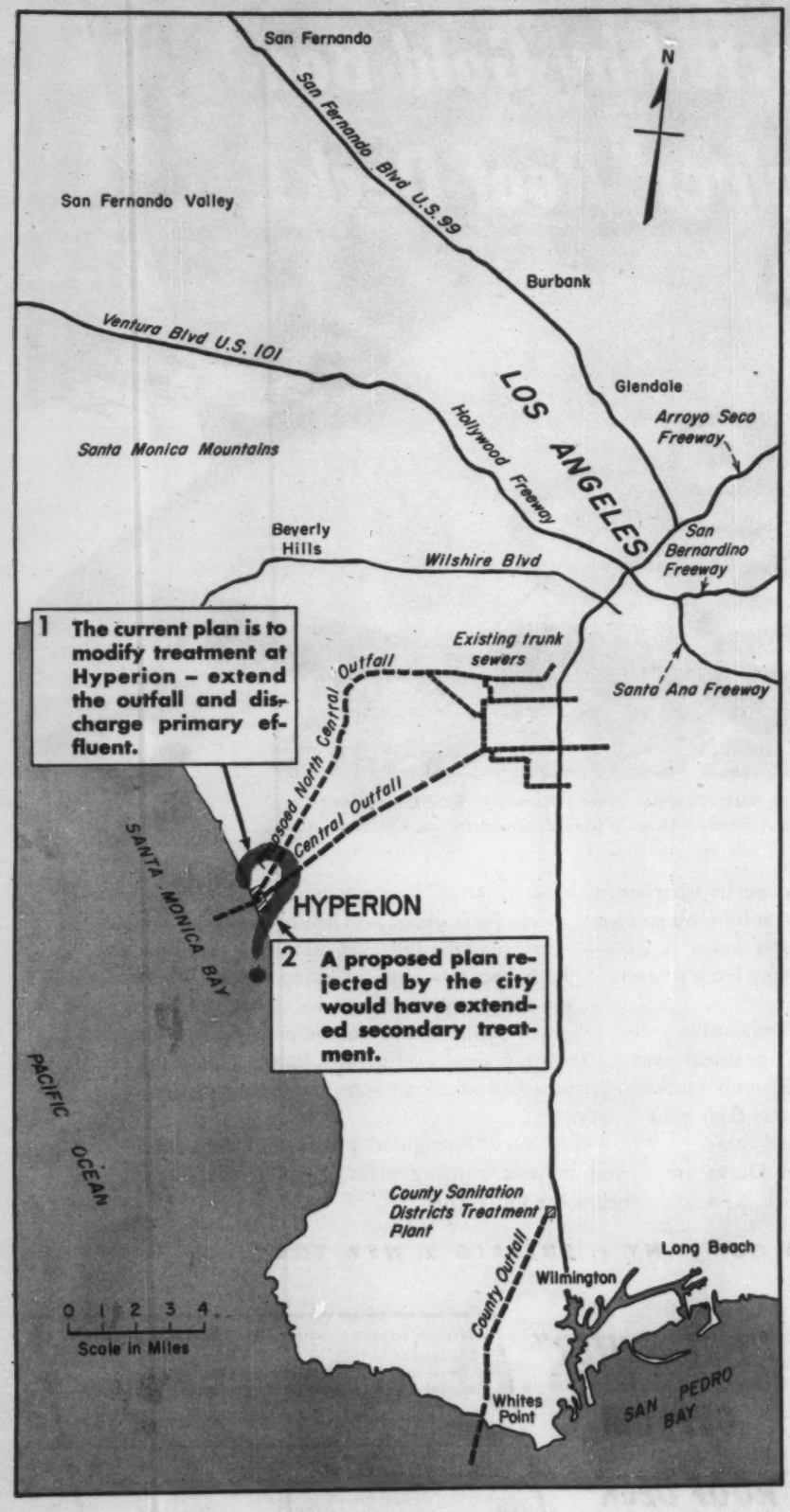
The Two Sides of the Los Angele



Background:

A political football was taken out of play a year ago when the City of Los Angeles finally decided what to do about expanding its sewage treatment capacity. Acting on the report of a Citizens Committee, the city decided against expansion of complete treatment at its Hyperion Plant, chose instead a reduction in degree of treatment there and extension of disposal deeper into the Pacific Ocean.

This action came as a welcomed end to indecision (ENR Apr. 21, p. 184). The choice was made between two fundamentally different methods of sewage disposal for Los Angeles.

Professional interest in this choice persists. It is easy to find a proponent for either side, and there is easily, too easily, found a distorted concept of what was proposed and what was chosen as the course now being followed.

ENR asked Frank L. Flood and Richard R. Kennedy, respectively partners in Metcalf & Eddy of Boston and the Engineering Office of Clyde C. Kennedy of San Francisco, to set forth the two sides of the picture as it has developed.

Here is the background—

Metcalf & Eddy recommended in 1944 that a high-rate activated sludge plant be built at Hyperion, with an ocean outfall terminating in multiple outlets one mile off-

I. Why Modify

Richard R. Kennedy
Partner, Engineering Office of
Clyde C. Kennedy
San Francisco, Calif.

The City of Los Angeles now has under design expansion of sewerage facilities to take care of the phenomenal growth that has occurred in its metropolitan area. The program adopted for these enlargements involves the modification of a present high-rate activated sludge plant to provide for primary treatment with dis-

Sewage Disposal Question

shore. The plant would treat an average dry weather sewage flow of 245 mgd and discharge an effluent practically clear, stable, free from objectionable odors and grease, and relatively low in bacterial content. Sewage pollution of the bathing beaches and waters would be entirely eliminated.

Hyperion Plant was designed and constructed by the city, Metcalf & Eddy serving as consultants.

Growth of the area was phenomenal, and on June 17, 1952, M&E recommended that the Hyperion Plant be enlarged to a capacity of 315 mgd (ENR Aug. 21, 1952, p. 32), and that a new plant be constructed on the Los Angeles River just below the San Fernando Valley, in stages to an ultimate capacity of 105 mgd. This plant would discharge treated effluent to the river and return sludge to the sewers for later treatment at Hyperion.

Recommendations for a separate sewage treatment plant along the Los Angeles River were not adopted; there was opposition on esthetic grounds, even to putting disinfected effluent in the river. Instead, the city moved to have trunk sewers bring all sewage to Hyperion and to extend that plant as required to treat these additional flows.

Meanwhile, the Los Angeles County Sanitation Districts had been handling sewage flows in an entirely different way. Handling sewage from areas mostly outside of the city, the Districts subjected up to 150 mgd to primary treatment and disposed of the effluent in deep ocean outfalls. In an effort to explore all possibilities, the Los Angeles City Council on August 12, 1953, contracted with County Sanitation District No. 2 (the one handling administration for all the others) to investigate the feasibility of diverting part of the city's flow to county facilities.

The District, in a report dated February, 1954, made no recommendations, but presented several possibilities. The most favorable would divert 153 mgd of sewage from the city's eastern fringe to the District's system. Under this plan, it would be necessary to expand the capacity of Hyperion eventually to 293 mgd.

The City Engineer told the city's Board of Public Works that he could not agree to this possible plan. He based his opposition largely on a conviction that the District's cost estimate for its favored plan was in his estimation about $11 million too low.

The great disparity between cost estimates and the fundamental difference between methods of disposal contemplated in the District diversion plan and the plan recommended by Metcalf & Eddy led to appointment of a Citizens Committee to study the various alternates. This Committee employed Richard Pomeroy and Associates of Pasadena, and the Engineering Office of Clyde C. Kennedy of San Francisco to review the entire problem.

The consulting engineers reported to the Citizens Committee last September, the Committee reported its recommendations in November. The Committee suggested an entirely different approach involving conversion of Hyperion to primary treatment and disposal of effluent through extremely long—5 or 6 miles—deep ocean outfalls. Subsequent to adoption of the Citizens Committee report by the City Council and passage of a $60 million bond issue last April, the joint venture called Hyperion Engineers was retained to prepare plans and specifications. Design work is under way now.

City officials are quick to point out that design of the new facilities is not frozen. Instead it may be altered in view of detailed investigations now under way. Guiding the program is a consulting board made up of a representative of each of the firms in Hyperion Engineers (D. Lee Narver of Holmes & Narver, Ray Spencer of Koebig & Koebig, and Irvan Mendenhall of Daniel, Mann, Johnson & Mendenhall) together with Fred Bowlus of Bowlus-Pomeroy Associates, Richard R. Kennedy of the Engineering Office of Clyde C. Kennedy and Lyall Pardee, city engineer. Lloyd Aldrich, former city engineer, has been retained as a consultant to the city but does not have a vote on this board.

Present Treatment

charge into the Pacific Ocean at a distance of approximately five miles from shore and at a depth of about 200 ft.

This apparent reduction in the degree of treatment for a metropolitan sewerage facility has excited both local and state-wide questions regarding the conditions which were considered in selecting or determining the program adopted.

To understand the engineering considerations that are the basis of the adopted program it is necessary to recall that the Citizens Committee for the sewerage problem was given the task of evaluating two differing proposals developed previously and presented to the city. This Citizens Committee was appointed by the mayor and was headed by George B. Gose, vice-president and general counsel of the Pacific Mutual Life Insurance Company.

One solution was the enlargement of trunk line capacity to make it possible to continue to convey all sewage to the Hyperion plant and install necessary plant units of the same type to provide for treating the additional flow with discharge through the existing outfall into Santa Monica Bay. The other solution was to remove part of the flow which has been designated as the east drainage of the Los Angeles River basin and to convey it to the same general location as the present Los Angeles County Sanitation Districts plant; provide primary treatment and discharge to San Pedro Channel.

The two programs that have been proposed had used different engineering criteria as bases of design, so the committee's first problem was to set up a common denominator for engineering comparison of the proposals as a basis for arriving at an economic evaluation of the two locations for taking the additional flow.

• **New requirements**—In the initial

construction of the Hyperion sewage treatment plant, the State Department of Public Health had control of design. The Hyperion plant, with a chlorinated secondary effluent discharged a short distance from shore met the design criteria of the State Health Department. The present requirement is that the plant shall be designed so the effluent shall meet the receiving water requirements set up by a Regional Water Pollution Control Board.

The Regional Water Pollution Control Board having jurisdiction over the area indicated that it would have the same requirements for discharges in both Santa Monica Bay where the Hyperion plant discharges and San Pedro Channel where the Los Angeles County Sanitation Districts plant discharges and where it was proposed that part of the Los Angeles sewage be diverted. In particular, it was recognized that both areas were used extensively for recreation and that the discharge of any sewage or waste must necessarily meet the requirements of bathing water standards as enforced by the state and local health departments.

• **Oceanographic studies**—Very little was known as to the oceanographic conditions that were existing at the two locations, and therefore, the Citizens Committee arranged for an investigation of both discharge sites—White's Point and Hyperion—by Scripps Institution of Oceanography, one of the campuses of the University of California.

The White's Point ocean outfall was found to be giving satisfactory results with very short-detention, primary settled and skimmed sewage (without chlorination) going out through two outfalls: one 5,000 ft long, 60 in. in diameter, discharging at a depth of 110 ft, and the other 6,700 ft long, 72 in. in diameter, discharging into a depth of 165 ft. The investigations indicated that under certain conditions the sewage from the deep outfalls at White's Point was more concentrated at approximately 50 ft below the surface with very little visible at the surface.

Most sewage outfalls into salt water are in bays or estuaries where discharge into a channel provides diluting capacity comparable to a moving stream. And before the first installation at White's Point most ocean outfalls had been of small sizes, and the important item of design had been proper construction and protection through the surf zone to give a structurally safe unit. Considerations of the point of discharge and conditions that might result from its selection were not found in any available reports.

The installation of the first outfall at White's Point, the 60-in. line, 5,000 ft long, which was installed in the early '30s, was the subject of extensive model studies by H. K. Palmer, hydraulic engineer for the County Sanitation Districts at that time. He developed an empirical method of predetermining the extent of a sewage field in the ocean. An article, which set up empirical formulas with tables and charts for determination of the sewage dilution and sewage field area, was published by Palmer and Rawn in the Proceedings of the ASCE. These findings of Palmer have been substantiated in the limited cases where ocean outfalls have approached conditions for which his studies were made.

• **Temperature effect**—With the installation of the 72-in. outfall, 6,700 ft offshore, to a depth of 165 ft by the Los Angeles County Sanitation Districts, the Palmer theories of diffusion were not always borne out. There were periods, during the summer season particularly, when there was no evidence of sewage pollution appearing on the ocean surface. In an attempt to explain these variations, additional studies were carried on by F. R. Bowerman, division engineer of the Los Angeles County Sanitation Districts, which indicated that a definite thermocline existed in the ocean during periods when no sewage appeared at the surface. The explanation evolved from these studies and further laboratory investigations indicated that during certain periods of the year a thermocline or rapid change of temperature with little change in depth existed from 20 to 50 ft below the surface. This layer of warm water could contain the sewage discharged below it. During the summer period off the Southern California coast the bottom waters remain fairly constant at 54 degrees F while the surface water is 63 degrees or higher. When this condition develops there is usually a very rapid change of temperature at about 30 ft below the surface and a properly dispersed mixture of sewage and cold ocean water can be retained below this temperature barrier.

• **Degree of treatment the question**—Both solutions presented to the Citizens Committee on the sewerage problem involved ocean disposal of the sewage effluent. One proposed short-period-detention primary treatment, with disposal of unchlorinated effluent into the San Pedro Channel based upon the results of a like facility of the County Sanitation Districts. The other proposed the discharge of a secondary treated effluent a short distance beyond the surf zone in shallow water with chlorination to meet the bathing water standards.

Both disposal methods have given satisfactory results as measured by the requirements of the Regional Water Pollution Control Board. While the Hyperion treatment plant showed excellent cost figures, commensurate with the type of treatment given, these costs were far in excess of what might be experienced if a lesser degree of treatment could be given to the sewage and a satisfactory ocean condition could be maintained. While chlorination was required at Hyperion with short outfall—and not at White's Point with a longer outfall into deep water—it appeared that a proper discharge location could be selected that would allow the elimination of chlorination as one of the treatment requirements and still provide adequate safety for each use.

With the information available as to the effectiveness of sewage disposal into the ocean, the evaluation of the alternate locations of disposal indicated that an alternate program should be set up for the discharge of primary treated effluent into Santa Monica Bay at a location that would give a degree of depth dispersion which would be equivalent to that available in the San Pedro Channel.

• **Deepest practical disposal**—The present limiting factor to the construction of ocean outfalls is a depth of approximately 200 ft, which has been established as the practical working limit for large diameter pipe laying. A location was selected in Santa Monica Bay for an outfall to be constructed to that depth, west from the Hyperion plant. The Santa Monica Bay shelves out on a very gradual slope between the Redondo Canyon on the south and the Santa Monica Canyon on the north. If an effluent line were carried out on this gradually sloping ocean floor it would extend approximately five miles before reaching a depth of 200 ft.

A study of all available oceanographic information covering this area indicated that it should be an excellent location for sewage discharge. In fact, it was found to have some apparent advantages over a like disposal in the San Pedro Channel. First, as mentioned, the 200-ft depth would be approximately five miles from shore and would therefore give a greater travel distance for any surface particles which might reach the surf zone. Second, because of the configuration of the Santa Monica Bay, if treated sewage were discharged more than four miles off of Hyperion, it would be restrained from direct travel to the surf zone by the numerous tide rips which usually exist in this area. The tide rips are normally two to four miles from shore, and in some of the

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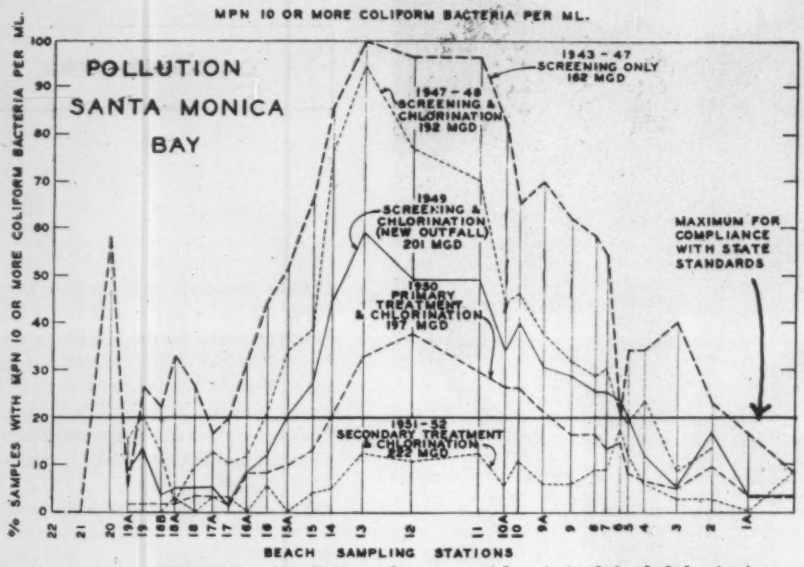

HYPERION'S RECORD of pollution abatement (above) is defended beginning on p. 52 where Author Flood asks, "Why Not Extend Present Treatment?"

dye tests that were made, a very definite surface barrier action was found to be present.

• **Committee's choice**—While the discharge of primary treated sewage approximately five miles from shore was not one of the solutions initially given to the Citizens Committee, it developed to be the best and most economical solution to the sewerage problem. The program was presented to the citizens and bonds to provide funds for the construction were voted by 10 to 1 majority on April 8, 1955. The essential elements of the plan adopted by the Mayor, Board of Public Works, City Council and citizens of the City of Los Angeles on the recommendation of the Citizens' Committe are as follows:

1. Construction of additional main trunk sewer capacity to continue to bring all the flow to the Hyperion treatment plant. A new line designated as the north central outfall would pick up sewage coming from an intercepting line from the San Fernando Valley and supplement existing capacity of the north outfall and central outfall which would not be capable of carrying the anticipated sewage flow.

2. Use of the existing sewage treatmeant plant for primary treatment. This would involve the provision of additional hydraulic capacity through the head works units of grit collection, metering, and channels into the existing preaeration and sedimentation units.

3. The existing preaeration and sedimentation units would be modified. They would be used for the full flow with more effective removal of settleable solids provided by increased weir length in the sedimentation basins.

4. A new ocean outfall would be constructed to discharge the effluent from the primary units at a distance of approximately five miles from shore. In order to have a nominal size effluent discharge outfall it was also proposed that an effluent pumping station would be installed to take care of storm flows and future peak flow conditions.

• **Hyperion modification "nominal"**—This very nominal modification of the existing Hyperion plant would still allow the existing secondary treatment facilities to be used for water reclamation at any time such was desired.

With the reduction in sludge volume by eliminating the secondary sludge produced by the secondary treatment it would be possible to utilize the existing digestion tanks for all future sludge treatment. The present plant disposes of digested sludge in a mechanical drier with sale at $4.50 per ton. The cost of producing this dried sludge is approximately $28 per ton. To eliminate this large operating cost and also because of a poor market demand for the product was proposed that digested sludge would be discharged by a separate line into the ocean in a northerly direction to the edge of a submarine canyon. This would be at a distance of between five and six miles from shore. While it was proposed to install the ocean sludge line of capacity adequate to dispose of all digested sludge, the existing facilities would be available to use as required to reclaim this valuable commodity for agricultural use at any time as dictated by market conditions.

On the basis of economical evaluation of the adopted plan, some of the factors influencing the selection of the program would be difficult to reduce to dollar value. A previous proposal to construct upstream treatment had been turned down because of esthetic objections to the discharge of treated sewage effluent into the Los Angeles River channel. The only alternate was for discharge into the ocean to be performed under satisfactory conditions.

• **Centralization desired**—From an organizational standpoint it was much more desirable to have all of the city's sewerage under a single agency control. It was also desirable to be able to fully utilize all of the existing sewerage system which, through the years, had been laid out to conduct all flow to the Hyperion site and to continue this flow pattern. The existing Hyperion plant, which was up to its design capacity, would require major plant construction to continue producing the same quality effluent. This effluent required continuous chlorination to meet the bathing water requirements in the surf zone. By nominal modification, using proven increased surface loadings and shorter detention periods, the existing Hyperion plant would require only minor modifications to produce an acceptable effluent for ocean disposal.

The point selected for ocean disposal would not be affected by the anticipated solids or BOD loading. The volume of water available for dilution was far more than the requirements for oxidation. The critical requirement for the ocean was to adequately disperse and retain the effluent to insure satisfactory quality in the surf zone.

In the plant operation, appreciable immediate savings would be realized in the elimination of the chlorine disinfection. This cost of chlorination is in excess of $200,000 per year. The elimination of the mechanical sludge drying, made possible by discharge of digested sludge into the ocean, would eliminate considerable labor force, power cost and chemical costs of over $100,000 per year. The secondary treatment facility was proposed to be left intact for use in water reclamation as soon as it was found desirable.

The present engineering design of the program is making provision for standard rate activated sludge operation of the existing secondary treatment facilities to reclaim 120 million gallons of effluent per day which can be used for industrial purposes or for recharging of the adjacent underground area in order to prevent salt water intrusion.

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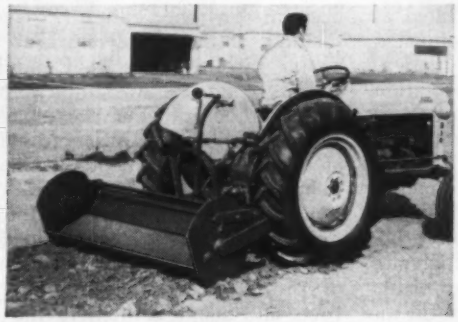

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2. Why Not Extend Present Treatment?

Frank L. Flood
Partner, Metcalf & Eddy
Boston, Mass.

Hyperion plant, recommended by Metcalf & Eddy in 1944 and completed and placed in operation in 1951, has provided sanitary protection of the waters of Santa Monica Bay and its bathing beaches. This was its purpose. Results obtained at this installation are graphically illustrated on the preceding page.

During the 12 months ending last June 30, the average flow treated at Hyperion was 244 mgd, compared with the 245-mgd basis of design. During this period, plant operation resulted in average reductions of about 78% in suspended solids and BOD (biochemical oxygen demand) and of 90% in chlorine demand of the primary plant effluent. These results are excellent as compared with those obtained in the operation of high-rate or modified activated sludge plants elsewhere, despite the fact that the air supply at Hyperion was not adequate to provide the most efficient plant operation.

Net cost of operation, exclusive of capital charges, for the fiscal year ending June 30, 1954, was $17.26 per million gallons of sewage treated, or $0.58 per capita from an estimated tributary population of 2,600,000. Warren A. Schneider, director of the Los Angeles Bureau of Sanitation, has estimated that net cost of operating the Hyperion high-rate activated sludge plant in the future for 315-mgd capacity would be $18.00 per million gallons, allowing for increased costs for wages and supplies, particularly chlorine.

The 1954 annual report of the New York City Department of Public Works states that in 1954 it treated 230,521 million gallons of sewage—200,834 mg of it by the activated sludge process. Cost of operation and maintenance for 1954, based on the first six months, was estimated at $22.48 per mg. The 1953 cost was $20.50 per mg and in 1952 it was $18.84 per mg.

These costs may be compared with the average costs per million gallons for operation and maintenance that were incurred at several representative *primary sedimentation plants* as listed in the accompanying box (at bottom of page).

Complete activated sludge treatment at the Cleveland Easterly Plant for a rate of flow of 102 mgd cost $21.40 per million gallons during 1954.

• **County influence**—In our opinion, decision on the currently favored method of sewage disposal at Hyperion by the Citizens Committee and its engineers was influenced by the method of the Los Angeles County Sanitation Districts (discharge of unchlorinated effluent off White's Point after a short period of detention). In effect, the city, contrary to the city engineer's recommendations, has adopted the policies and premises of the Los Angeles Sanitation Districts and adapted them to the conditions in Santa Monica Bay at Hyperion.

It would appear that an effort was made to develop a plan to compete economically with a district plan, which envisioned "a plant operation and maintenance cost of $3 per million gallons appropriate for use in estimating the cost of disposal" of sewage from the Los Angeles system through facilities in the District, exclusive of amortization or depreciation of plant investment.

This district estimate was justified by the figure of $1.82 per million gallons, presented as the net operation and maintenance cost for the fiscal year 1952-1953 for the present Joint Disposal Plant of the Los Angeles County Sanitation Districts. These low costs have not been, and we believe cannot be, duplicated at any other plant in the country. The average cost of operating primary treatment plants at Buffalo, Cleveland, Detroit, and Minneapolis-St. Paul during recent years has been about $15 per million gallons. However, it is not within the scope of this paper to discuss the district plan for sewege disposal, either for the county Sanitation Districts or for the city. Our discussions are confined solely to the method of disposal now proposed for Hyperion.

• **Hyperion reclaimed beaches**—The effluent from the Hyperion Plant discharges to Santa Monica Bay as shown in the chart (p. 50). Santa Monica Bay beaches extend for more than 16 miles from Redondo Beach on the southeast to beyond Santa Monica Beach on the northwest. The insanitary conditions of the beaches prior to operation of the present Hyperion Plant led to the quarantine of 10 miles of beach between 14th Street in Hermosa and Brooks Avenue in Venice. This quarantine was not lifted until the summer of 1951, after complete treatment at the present Hyperion Plant was placed in operation.

As previously stated, abatement of conditions, physical and bacterial, which led to the quarantine was the primary reason for the method of treatment recommended in 1944. At that time it was essential that there should be no doubts as to the ability of the recommended plant to accomplish this objective. The results speak for themselves.

The bacterial pollution due to the discharge of sewage and plant effluent is shown graphically also. For screened sewage, the bacterial pollution with a rate of flow of 162 mgd exceeded the maximum for compliance with state standards on the beach at a distance of 5.7 miles to the southeast and 7.7 miles to the northwest of the Hyperion outlet. For primary treatment with disinfection, the above maximum was exceeded at a distance of about 1 mile southeast and 4.1 miles northwest of the outlet, with a rate of flow of 197 mgd and using 400 tons per month of chlorine. With secondary treatment and chlorination, the bacterial pollution, has uniformly been well below the state standards for beach waters.

• **Question of chlorination**—The current decision to provide for discharge of primary effluent unchlorinated at a distance of 5 to 6 miles from shore and at a depth of about 200 ft is based largely on the theory that the dilution afforded and the time required for the diluted effluent to reach the beaches are such that there will be no undue turbidity, and that the bacterial pollution will be reduced to below the bathing water standards. In our opinion adequate data are not avail-

Primary Plant Costs:

Plant	Year	Average flow mgd	Cost of operation and maintenance, per million gallons
Buffalo	1953-54	131	$15.35
Cleveland Westerly	1953	33.4	16.37
Detroit	1953-54	444	13.74
Minneapolis-St. Paul	1954	139	14.20

able to substantiate such a theory. We believe past experience and the extent to which pollution has traveled from the present and previous outlets at Hyperion indicate the contrary to be true.

It is of interest to note that Orange County in Southern California started chlorination of its sewage treatment plant effluent this past September, 1955.

The treatment consists of about 2-hr detention in primary sedimentation tanks. The effluent is discharged about 7,000 ft from shore at a rate near 30 mgd. Prior to chlorination, bacterial counts of 70-plus per milliliter were obtained on shore at distances up to 3 miles from the outlet. As a consequence, the chlorination program was inaugurated.

There is evidence that the shore waters adjacent to the Los Angeles County Sanitation Districts' outlets contain coliform bacteria to a degree exceeding the state's standards for salt water bathing for a distance of 2.5 miles east and 6 miles west of the outlets, even after extension of the outfall and additional means for diffusion of effluent had been placed in operation.

When unchlorinated screened sewage at an average rate of 162 mgd, discharged from the former outlet at Hyperion, caused excessive bacterial pollution of the beaches at a distance of nearly 8 miles from the outlet; and *chlorinated* primary effluent, at an average rate of 197 mgd discharged 1 mile from shore in 50 ft of water, caused excessive bacterial pollution of the beaches at a distance of more than 4 miles from the outlet; what assurance is there that *unchlorinated* primary effluent, discharged at a rate of flow of 420 mgd, 5 to 6 miles from shore at a depth of 200 ft as now proposed, would not cause undue contamination. The proposed outlet would be less than 6 miles from Manhattan, El Segundo, Hyperion, and other extensive sections of the Los Angeles beaches.

• **Economy hinges on disinfection**—The economy of the proposed project to discharge settled sewage to Santa Monica Bay depends upon realistic operation cost, and whether or not disinfection of the effluent will be required. The difference in chlorine demand index as developed at the Hyperion plant between the primary effluent and activated sludge plant effluent was 23.37 ppm on the average during the year ending June 30, 1955. To satisfy this difference in chlorine demand index for satisfactory disinfection of the settled sewage would require about 194 lb of chlorine per million gallons, which at the present price of $103 per ton would cost $10.00 per million gallons of sewage treated. This is considerably more than the $6 per million gallon cost of operating the activated sludge units at the Hyperion plant, including effluent disinfection. Consequently, if disinfection of the primary plant effluent is required the hoped-for economy of the effluent pumping station and long outlet to Santa Monica Bay would fail to materialize.

The ineffectiveness of chlorination of primary effluent is shown on the chart. The chart cannot show the saving in chlorine by using secondary treatment.

It should be noted that the chlorine demand index of the primary effluent has steadily increased as the percentage of flow from remote areas tributary of the Hyperion plant increased. The increase in chlorine demand index in the primary tank effluent has been from 19.1 ppm in 1951-1952 to 25.8 ppm during the 1954-1955 period.

On the other hand, the chlorine demand index of the present plant effluent has decreased from 5.8 ppm in 1952-1953 to 2.45 ppm in 1954-1955. These figures reflect the increased efficiency of the high-rate activated sludge plant.

• **Long outfall critical**—One of the questionable features of the proposed plan is the construction and operation of a submarine digested sludge pipeline 6½ miles long and 250 ft deep at its terminus. Experience with the operation of similar pipelines elsewhere would indicate the necessity for cleaning the line periodically. There is no assurance that the pipeline cleaner will not become stuck in the line at a remote and inaccessible point, whence it will be very difficult to locate and to remove. The removal of the obstruction, which might well take the form of an extended plug of grease and solids ahead of the cleaner, would also present a serious maintenance problem.

Another factor, perhaps more theoretical than real at present, is the potential salvage of adequately treated sewage effluent for industrial use or for irrigation. With water a critical material in Southern California, it is quite probable that such salvage will become an economic necessity in the not distant future. If this occurs, expenditures for the pumping station and the long pipeline into the Bay will have been wasted, at least in part. Salvage of the humus value and the limited fertilizer value of the sludge should not be dismissed as wholly visionary.

However, neither of these two conservation measures are too significant at the moment, but with the area developing so rapidly with constantly increasing demands for water, it would seem to be wise to expect need for effluent salvage.

The other bay cities are much concerned over the present city plan and are watching developments very closely. Representatives of the city have assured them that the bay waters will not be contaminated or polluted regardless of what has to be done in the way of treatment or sterilization or cost.

• **Summation**—Our opinions are summarized as follows:

1. The discharge of settled sewage to Santa Monica Bay as proposed without disinfection may well cause objectionable conditions because of: a. Bacterial contamination of beach waters; b. Excessive turbidity of bay waters; c. Sewage solids on the bathing beach.

2. Disinfection of the settled sewage would not remove turbidity, and would be more costly to operate than the secondary treatment units now provided, including disinfection of the final effluent from the complete treatment plant.

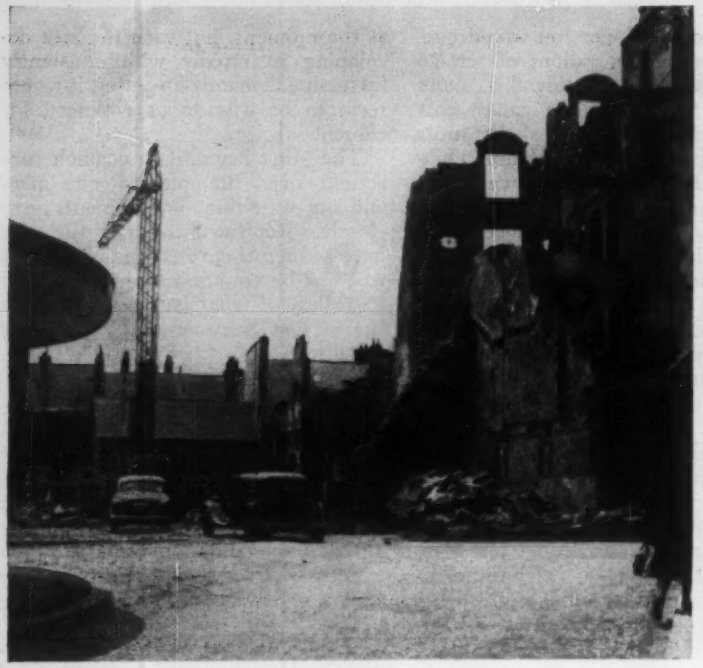
3. The operation of a high-rate activated sludge plant, with the disposal of all of the solids removed either by drying and sale as fertilizer or by incineration, would remove all danger of excessive turbidity in the beach water.

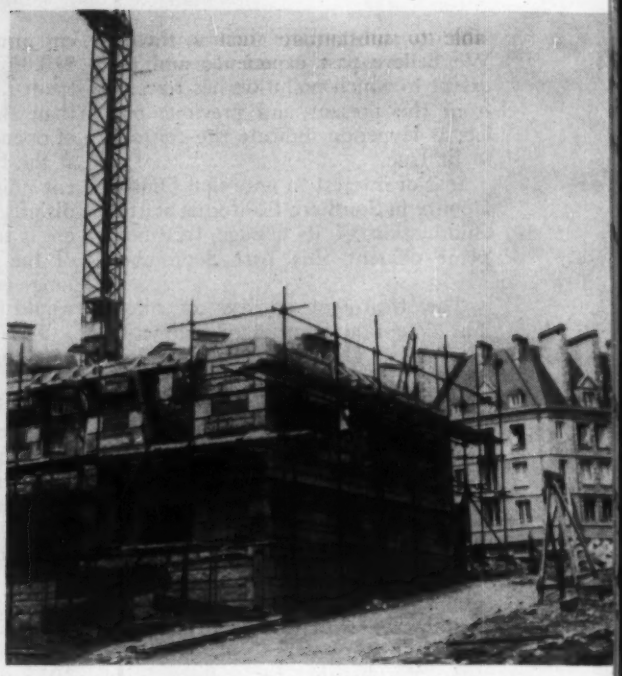
4. The construction of the effluent pumping station and the 5-mile long outlet conduit into Santa Monica Bay is an unnecessary expense at the present time.

5. The proposal to construct a pipeline 7 miles long for discharge of digested sludge in Santa Monica Bay at a depth of 250 ft introduces a number of problems and questions which are not as yet resolved: a. Possible objectionable effect of discharge of digested sludge; b. Probable necessity for periodic cleaning of line, and possible resultant difficulties from blockage during cleaning operations.

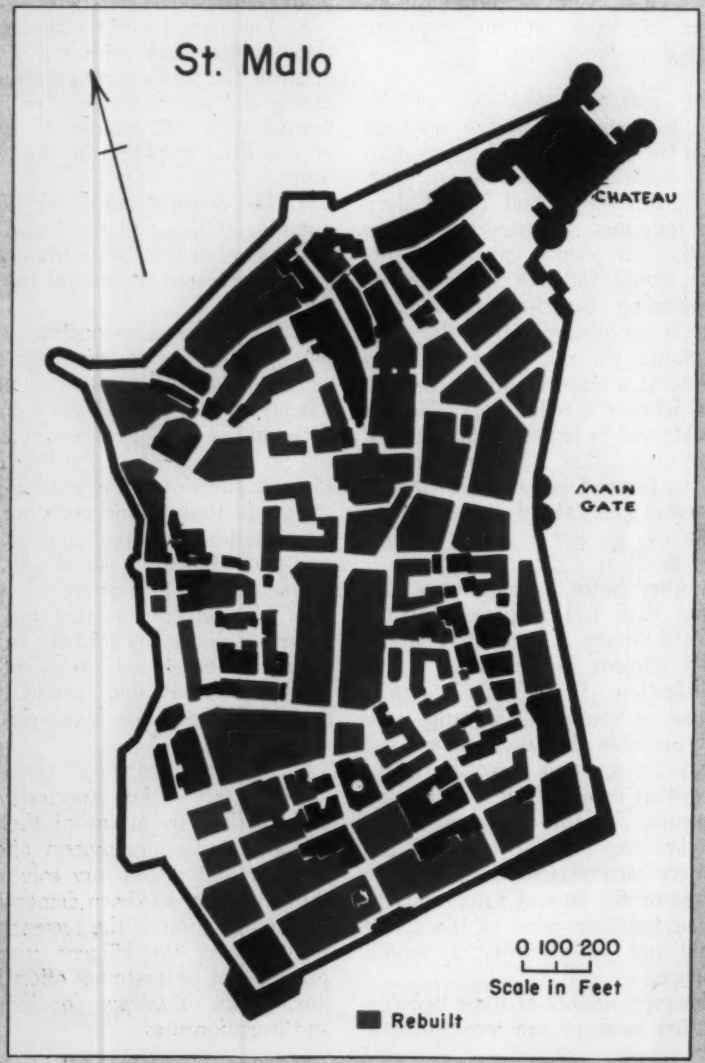
6. The fertilizer market for dried Hyperion sludge has not been fully explored or developed. It is possible that considerably more income can be derived from the sale of the processed sludge.

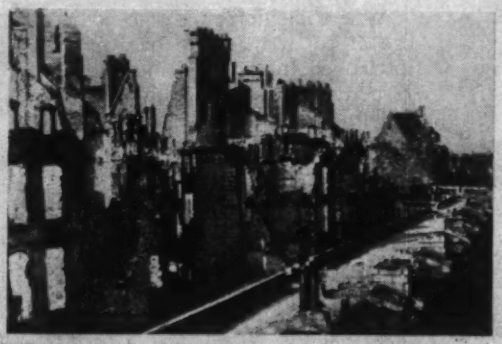
7. The treatment of all the sewage from the city of Los Angeles system, at Hyperion, by means of the high-rate activated sludge process, affords a practical and satisfactory solution to the problem as has been demonstrated by the operation of the present plant. Furthermore, the effluent from the present type of treatment offers future possibilities of salvage for industrial and irrigation uses.





Bombed and Burned . . . Now Being Rebuilt





BEFORE: Looking north along top of ramparts from Main Gate fire-gutted mansions and shell-pocked Chateau present a dismal sight.

BEFORE: When the Germans surrendered the city a view west from the Main Gate showed rubble piles and a spire-less cathredral.

Famous Walled City Rises from Its Ruins

AFTER: Reconstruction has restored the buildings to their 17th century condition and rebuilt the promenade atop the old ramparts.

AFTER: The same street is now lined with replicas of its original buildings but the cathredral still needs a new spire.

St. Malo, on France's english channel coast, the modern world's best example of a seaport-fortress of the Middle Ages, has erected more stone masonry buildings during the past five years than have probably been built in the same period in the entire U. S.

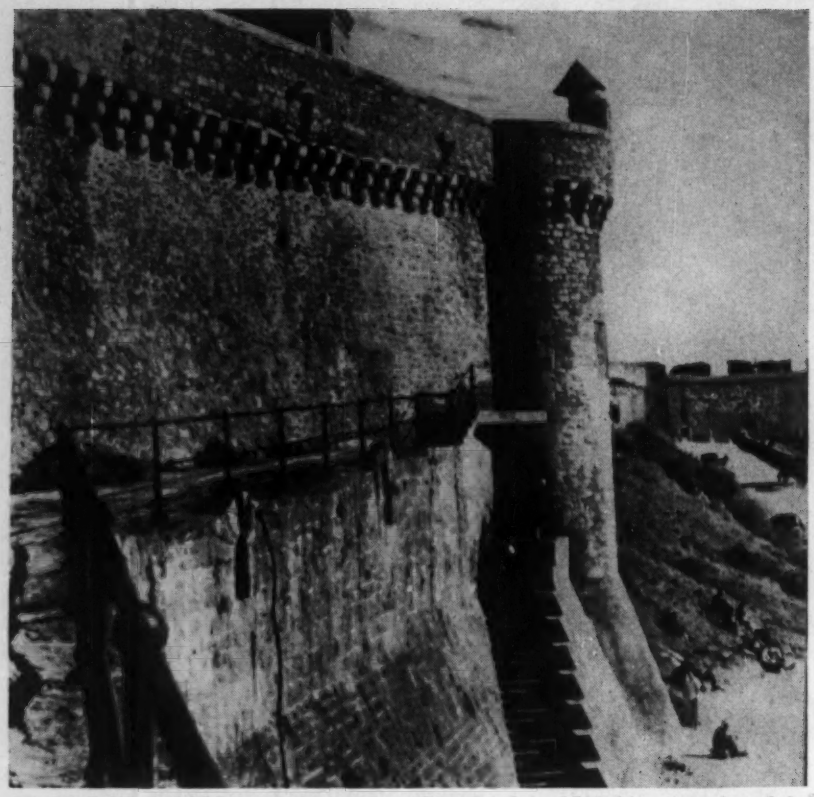
It has been a labor both of love and necessity. St. Malo was a war casualty, so completely destroyed that less than twenty percent of the 800 buildings that covered its 50-acre rampart-enclosed site remained after its ordeal of bombing, shelling and burning in August, 1944. Its unique history required its rebuilding for sentimental reasons. Its commerce in fishing and its tourist trade made its reconstruction economically mandatory.

The new city that the French have raised at St. Malo is better, more modern than the old. It is at the same time a true representation of its former self. For in much the same spirit as our own Colonial shrine at Williamsburg, Va., has been recreated, St. Malo's rebuilders have sought to retain both its original aspect and architecture. Every structure of historical importance has been exactly reproduced, with only such permissible variations as the substitution of concrete floors for the old combustible wood framing and some shaving on the thicknesses of old walls.

Most of these historic buildings occur in the perimeter blocks just within the ramparts. Farther toward the interior of the town, where hundreds of small and dingy quarters were jumbled together and pierced with a rabbit-warren of streets, modern concepts of sanitation and fresh air have been permitted control. Fewer, but wider streets now exist, larger apartment-type dwellings and shops have been built and squares and small gardens introduced. But the architecture and general appearance is made to conform to that of the historic buildings.

It was largely by the French government's decision to declare St. Malo a "monument historique" that its rebuilding—at least in its past image—was possible. For with the federal government standing most of the cost of the famous structures and of utilities, the local residents' investment was reduced to a fraction of the whole. If some or even most of the federal contribution was possible because of U. S. economic aid, the French have justification in the fact that St. Malo is a useful adjunct to the economy. Always a money-maker as a tourist center for foreigners—particularly from Britain, only a few miles away—a reconstructed St. Malo should quickly flourish again in this respect.

Historically, St. Malo's position and importance are unquestioned. Dating back as a town and seaport to the 11th century at least, it became by the 14th century an impregnable seaport fortress, resisting all efforts of the British and Dutch to capture it as a bridgehead for invasion. Later, its sea captains became so proficient at privateering when war was on the horizon (as it was almost continuously) that St. Malo properly became known as the city of corsairs. Its mansions



ST. MALO'S WALLS are truly massive. Completed in 1500 but strengthened by Vauban, the French military engineer, two centuries later, they are over 20 ft thick and rise at certain points to over 50 ft.

of today, the "monuments historique," were built with the proceeds of their booty. One of the gate-controlled basins of its port carries the name of the famous pirate, Duguay-Trouin, and a statue of another, Surcouf, who preyed on British shipping during the Napoleonic Wars, stands on one of the quays. But while they were pirates to the enemy, to the French they are among the most illustrious of patriots.

For Americans, however, St. Malo's fame rests on another of its sea captains, Jacques Cartier, who in 1534, sailed into the St. Lawrence River and discovered Canada for the French.

To engineers, St. Malo has a special appeal because of the name of Vauban, the great French fortress and port builder. It was he, about 1700, who strengthened and fortified the ancient walls, and made them the ramparts they are today. It, therefore, becomes a matter of interesting comparison to note that the next time St. Malo was fortified, nearly 250 years later, it was another great engineer, the famous German, Todt, who carried out the work.

Because of what Todt did in 1942, St. Malo became a pile of rubble in 1944, and is a reconstructed city today. So well did the Germans fortify the place (although most of their big guns were mistakenly pointed seaward) with tunnels, block houses of 4 ft thick concrete and pill boxes of 12-in. steel plate, that they refused to give it up without a fight. And for the same reasons the Americans could not safely leave it in their rear, even though they quickly bypassed it in their fight south from the Normandy beaches. German obstinacy sealed St. Malo's fate, and Allied shells and incendiary bombs destroyed it.

From the time the Germans surrendered on Sept. 3, 1944 until 1946, St. Malo did nothing more than dig itself out. Some 650,000 cu yd of broken masonry was hauled out through the only two street-level gates through the ramparts, and sorted for reuse or used for fill. Emergency shelter had also to be provided in this period because 3.2 million of the 3.86 million sq ft of floors used by the 7,000 inhabitants had been destroyed.

Then with the aid and advice of the national Ministry of Reconstruction, the plans for the new city were drawn up. They contemplated, as noted previously, restoring the historic buildings, largely around the perimeter of the city, and razing to the ground all of the interior and building anew. This rebuilt area comprised 30 of the 50 acres within the ramparts, and of this 30 acres about 10 were reserved for streets and open spaces. The latter were sited mostly in the interior of lots as courtyards or gardens. The new streets are many fewer in number than formerly, made possible by combining many small blocks in the original city into larger parcels. The streets are also wider, in general 22 ft, while formerly many were no more than paths.

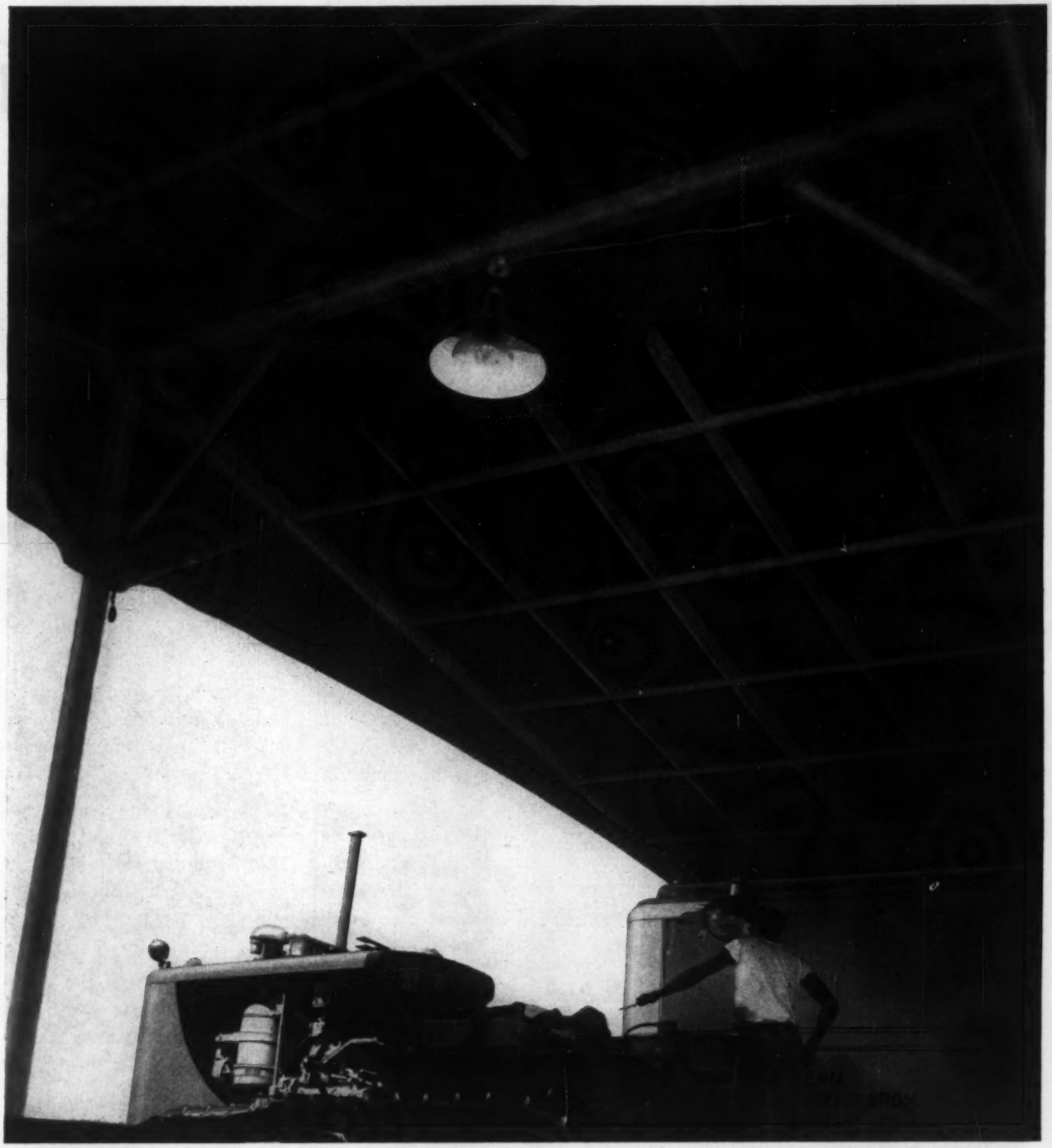
In this interior part of the city, single large buildings replace the many small ones. These buildings are of a type dictated by the great mansions and other historical buildings—of stone masonry, five stories high, surmounted by steep slate-covered roofs, the latter pierced by windows serving the top floor. For the most part, these new buildings can be classed as apartment houses with shops on the ground floor. Most of the apartments are reasonably spacious, designed so they can be temporarily subdivided in the summer when the normal population of the city is augmented four or five times by the influx of tourists.

To accomplish this regrouping of properties, some 600 individual owners had to be brought together in a cooperative organization, and many legal tangles worked out. Also the city set up a Reconstruction Syndicate to let contracts, cooperate with the Ministry of Reconstruction, and to oversee the rebuilding work.

Once the property titles were settled the operation became almost a municipal public works undertaking. Priorities were set up to govern the reconstruction. In 1949, for example, work was begun on the Chateau, the city hall and several apartment buildings. The next year two historic residences and four or five more apartment buildings were added. Schools, hospitals and the courts building were undertaken in 1951, and by 1953 all reconstruction was under way.

The end of this year should see the city practically restored in its new dress and aspect. The only modern notes, i.e. without any suggestion of the past, occur in the fish and vegetable markets and a big modern casino, the latter, however, being outside the ramparts and thus not truly a part of the walled city. The market buildings are composed of open stalls and counters roofed over by oval-shaped slabs that cantilever from interior supports.

Numerous contractors have been called in to carry out the actual rebuilding. Some may have only one structure, others handle more extensive contracts. All utilize the light hammerhead-type cranes, common in the French building industry, for lifting and placing their materials. Concrete is mixed in small mixers, raised in buckets by these cranes. Otherwise the work is manual, the skilled stone masons plying their trade much the same as their ancestors did when the original buildings were built.



MT. VERNON TARP HELPS EAST MEET WEST–Western Contracting Corporation is using Mt. Vernon duck as a roof tarp for their equipment maintenance shop while building part of the Indiana East West Toll Road. Manufactured by the Hoosier Tarpaulin & Canvas Goods Co., Inc., the huge tarp is suspended over two portable work shop trailers and provides a work area 34 x 65 feet. Canvas side drops provide protection against all kinds of weather.

This is another example of how fabrics made by Mt. Vernon-Woodberry Mills, and the industries they serve, are serving America. Mt. Vernon-Woodberry's engineers and its laboratory facilities are available to help you in the development of any new industrial fabric or in the application of those already available.

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Hydrostart

IF you're running a General Motors Detroit Diesel far from civilization—or in extremely cold weather—here's a new low-cost hydraulic starting system that insures fast starts every time.

This Aeroproducts Hydrostarter spins a Diesel fast, has no parts or components that require regular replacement, costs less to maintain than electric starting systems.

It sells for a lower price than any other nonelectric Diesel starter.

And it's available today from your General Motors Diesel distributor.

EASY TO INSTALL SIMPLE TO MAINTAIN

Your GM Diesel distributor or dealer can quickly install the Hydrostarter on your Detroit Diesel engines. The system is simple. All it takes is a few hours' time for installation, and arrangement of some of the components is optional.

With a Hydrostarter on your Detroit Diesel you'll free yourself from the usual starting problems. The system is completely self-contained—normal routine maintenance checks are all the care it ever needs.

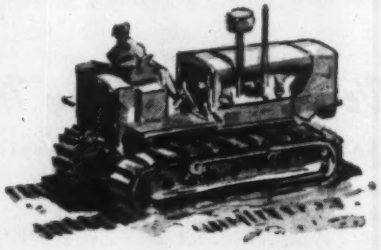
HOW IT WORKS

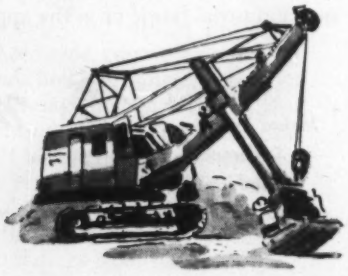
Heart of the system is a hydraulic starting motor operated by cil under high pressure. An engine-driven pump builds up and maintains pressure in a piston-type accumulator.

To start a General Motors Diesel equipped with a Hydrostarter, the operator opens a simple control lever to admit this oil to the motor which spins the engine. The control lever also completely engages the starting motor's gears with the flywheel before operation.

Your mechanics will get good use from the hand-operated pump which can be used to rotate the engine's flywheel slowly for timing adjustments. This pump can also be used to raise pressure if needed. The oil supply is stored and filtered in a reservoir.

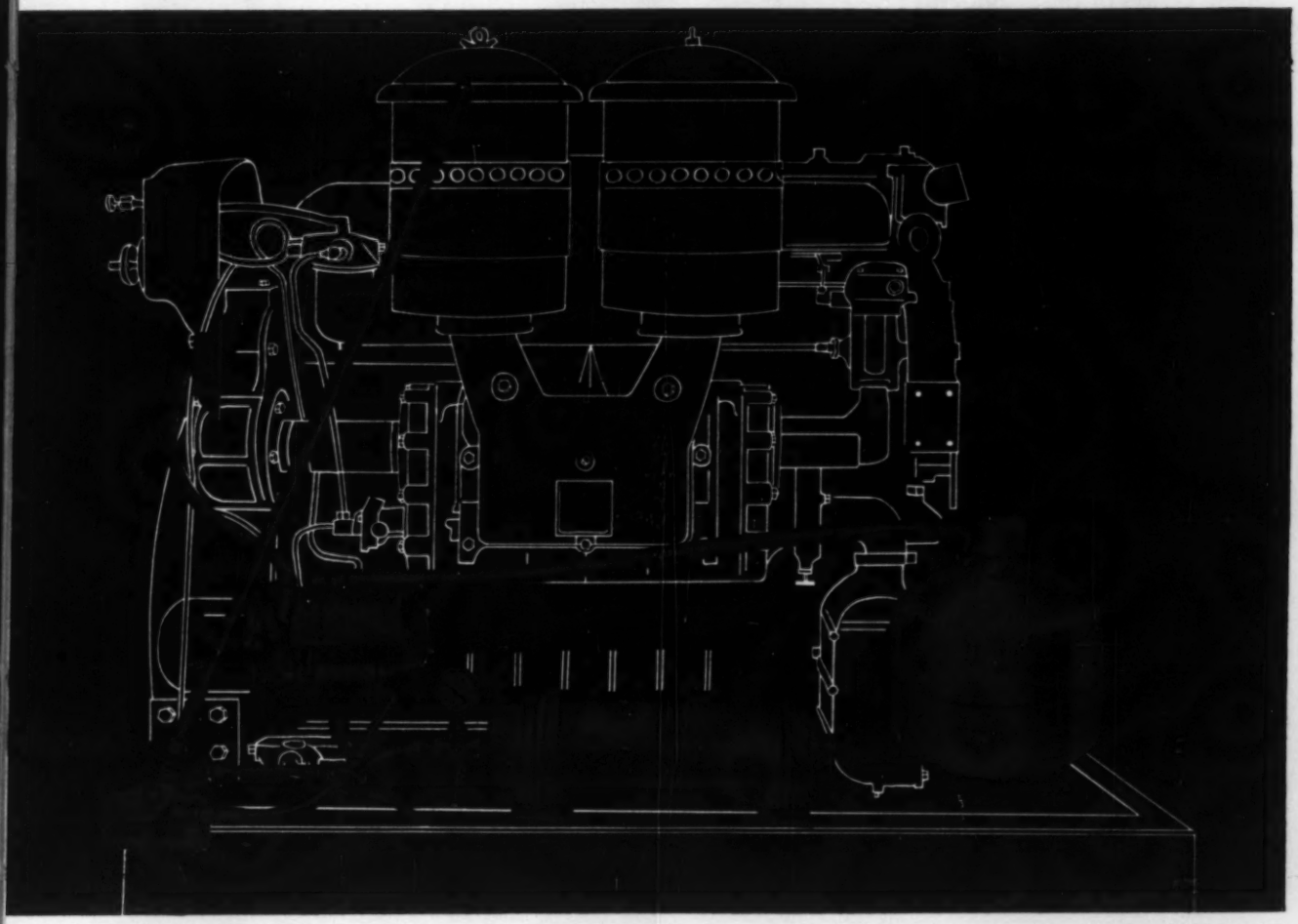
Right now—before winter sets in with a vengeance—is the time to see your GM Diesel distributor about the new Hydrostarter. He can quickly install this new starting system on your Detroit Diesel engines—or can give you full information on the new Hydrostarter.





Detroit Diesel Engines—

er NEW LOW-COST HYDRAULIC STARTING SYSTEM



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America's Largest Exclusive Builder of Diesel Engines

Single Engines . . . 30 to 300 H. P. *Multiple Units . . . Up to 893 H. P.*

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GENERAL MOTORS
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Big output is built in

Individual Design

We believe that the right way to build an excavator is to match every part—from boom point to treads—to the specific rated capacity of the machine. At Bucyrus-Erie we call this Individual Design.

Here's what it means

Individual Design means striking the right balance between power, weight and speed for sustained high output at low cost over a long period of time. Bucyrus-Erie excavators match engine to dipper size so there's no waste of power; deck machinery components are not overloaded or underworked; boom strength and weight are right for the dipper size. There's never any overdippering or underpowering.

Here's how it pays off

This kind of design keeps Bucyrus-Erie excavators out front in production, with all parts working in smooth, efficient coordination. It keeps them on the job year after year with minimum down time and maintenance—there is no excess wear and tear on moving parts.

Individual Design is a big reason why Bucyrus-Erie excavators are still working profitably when others have lost their usefulness.

Your operations can use this kind of money-making performance so get the full details from your nearby distributor. He has all the facts on Bucyrus-Erie excavators from 3/8 to 4 cu. yd. 155E55

BUCYRUS ERIE

South Milwaukee, Wisconsin

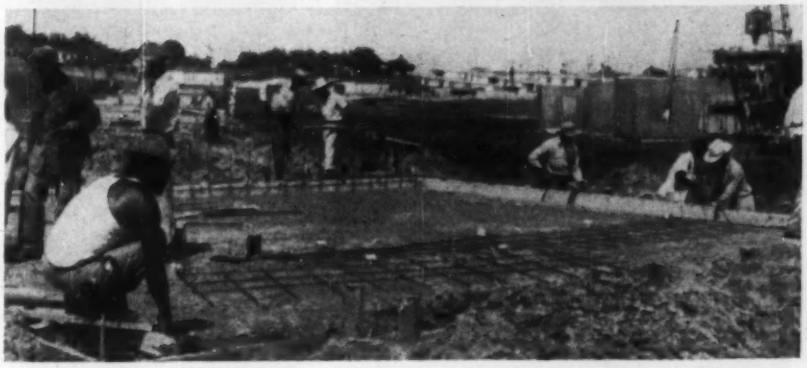
A grading project on U.S. Highway 85-87, near Greenhorn, Colo., was handled by this 1½-yd. Bucyrus-Erie 38-B. Machine owner is the Pioneer Construction Co. of Pueblo, Colo.

To answer a desperate need, it's . . .

Housing in a Hurry for Puerto Rico

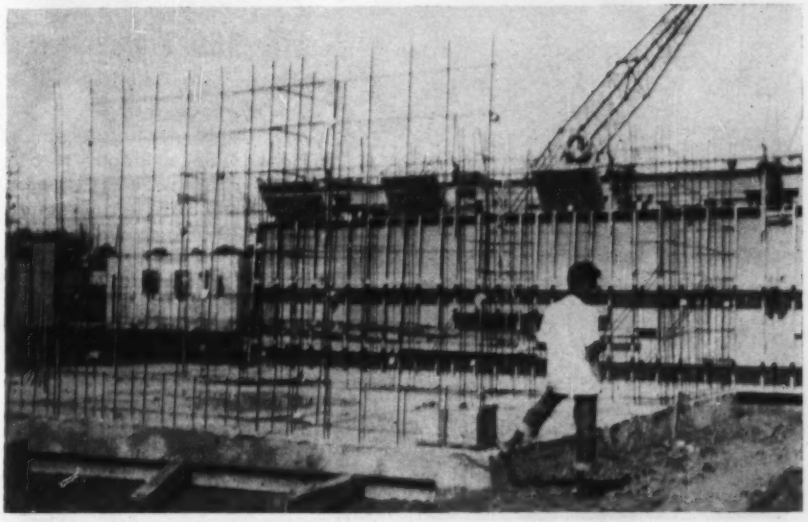
Foundation

For one of 1,600 houses for Villa Las Lomas, in metropolitan San Juan, Puerto Rico, is relatively simple. 'Dozers clear off about foot of topsoil, backhoe digs footing trench, workmen with small tampers and clay spades can achieve about 100% compaction of red, sandy clay subsoil. Construction pace is now six complete houses per day.



Then Floor

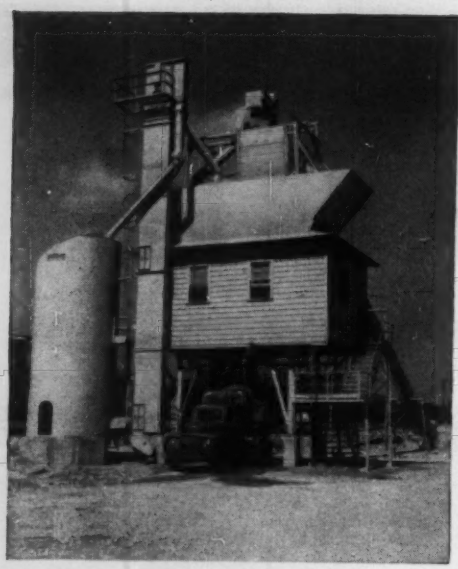
For basementless structures is cast atop compacted clay, in which utility lines have already been placed, light mesh reinforcing acting as binder. Simple forms go into excavated footing trench, concrete is placed by bucket. Rexach & Rivera, San Juan contractor, has 700 men at work on 200 acre project. Labor is plentiful—common laborers get 40 to 60 cents an hour.



Reinforcing Cage Is Next

Light $\frac{3}{8}$ in. wire is used. Project, one of biggest aimed at solving desperate housing problem, is jointly sponsored by Ibec Housing Corp. and Corbetta Construction Co., land owned by combine of Corbetta and Rexach & Rivera. FHA is backing mortgages, banks, insurance companies are financing. More than 120,000 cu yd of concrete will go into completed $11 million project.

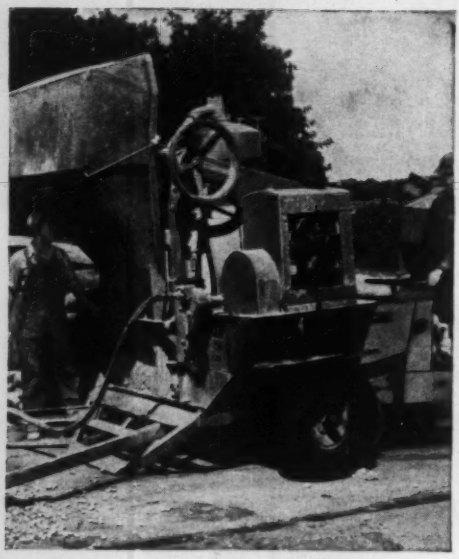
(Continued on page 64)



Johnson 50 to 125-yd. Roadbuilders plants

Flexible All-Welded Roadbuilders Bin gives you a portable batch plant for 2, 3 or 4 aggregates, or converts to transit-mix (shown) or central-mix plant for bulk cement and 2 or 3 aggregates. Can be equipped with 1 or 2 multiple material Hi-Speed Batchers, size 34 Roadbuilders Batcher, or truck-mixer charging batcher in 2 to 5 cu. yd. sizes. Bin available with 2, 3 or 4 compartments, 50 to 125 cu. yds. Also: silos, elevators, buckets.

C. S. JOHNSON • Champaign, Ill.
(Koehring Subsidiary)



7-second discharge with Kwik-Mix 11-S

Saving important seconds on every batch of concrete, tilted Flow-Line Discharge Chute pours full 12.1 cu. ft. batch in 7 seconds. Kwik-Mix 11-S Dandie® also has side or end discharge, 2 or 4 wheels, and special tower attachment. Other sizes: 3½-S to 16-S. Also check Kwik-Mix bituminous, tilt and non-tilt plaster-mortar mixers . . . and Moto-Bug® (power wheelbarrow) shown here. Ask your Kwik-Mix distributor for all facts.

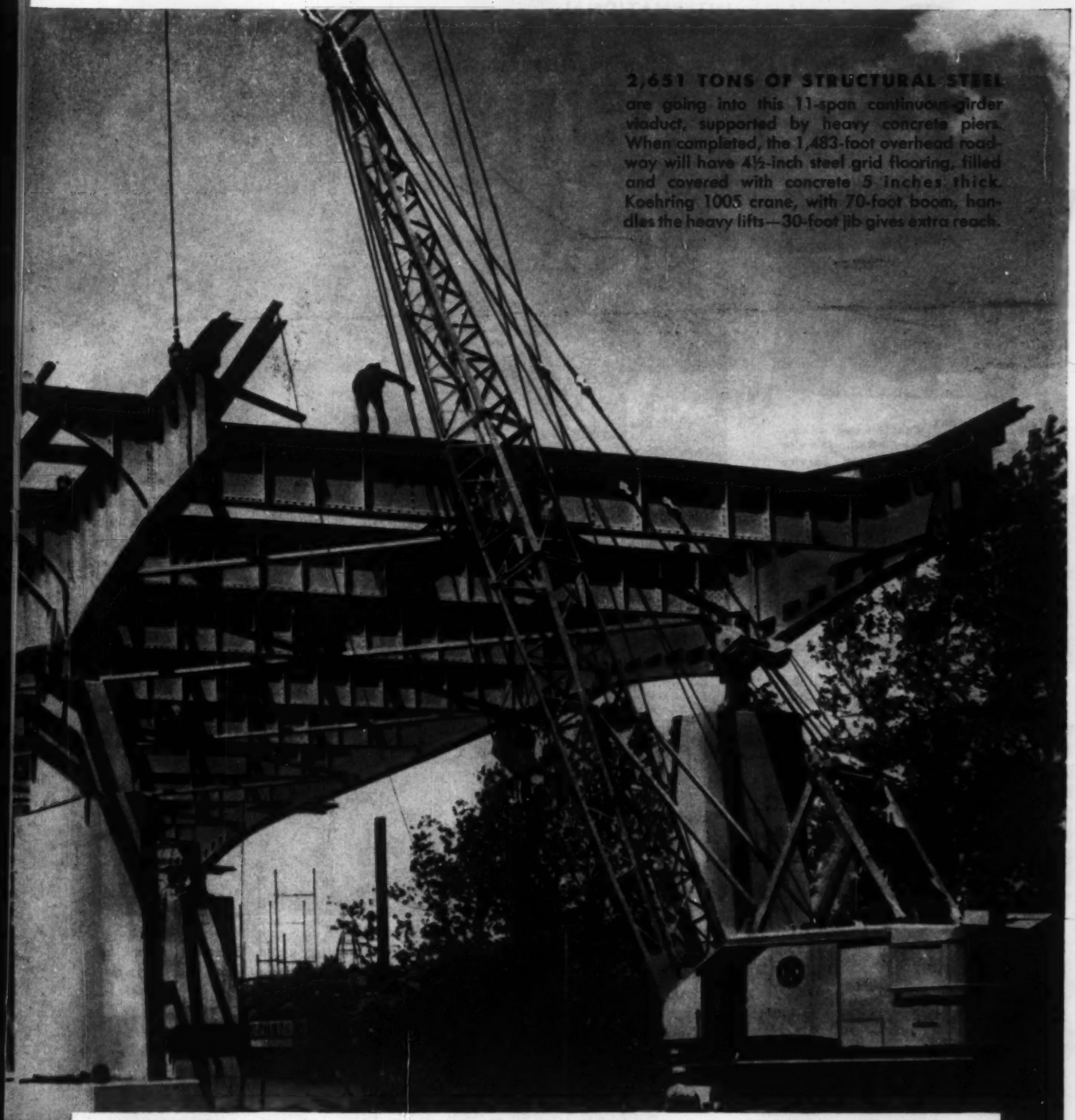
KWIK-MIX • Milwaukee, Wis.
(Koehring Subsidiary)

25 feet per minute with 150 Trenchliner®

On drainage, irrigation and utility trenching, 150 wheel-type Trenchliner digs 16 to 26 inches wide, at depths to 5¾ feet. Hydraulic wheel-hoist maintains close grade tolerance. 30 digging feeds range from 12 inches to 25 feet per minute. Has square or round-bottom buckets; gumbo lips or "Tap-In" teeth; 16 or 12-inch crawlers; gas or diesel power. Tile box and chute optional. Parsons line includes 5 other models, all sizes and types.

PARSONS • Newton, Iowa
(Koehring Subsidiary)

T704L



2,651 TONS OF STRUCTURAL STEEL are going into this 11-span continuous girder viaduct, supported by heavy concrete piers. When completed, the 1,483-foot overhead roadway will have 4½-inch steel grid flooring, filled and covered with concrete 5 inches thick. Koehring 1005 crane, with 70-foot boom, handles the heavy lifts—30-foot jib gives extra reach.

How much will it lift?

Check Koehring lift capacities:

205 CRAWLER	(½-Yd.)	20,000 lbs.	30-foot boom at 10-ft. radius
205 ON RUBBER	(½-Yd.)	30,000 lbs.	25-foot boom at 12-ft. radius
304 CRAWLER	(¾-Yd.)	27,800 lbs.	35-foot boom at 12-ft. radius
304 ON RUBBER	(¾-Yd.)	50,000 lbs.	30-foot boom at 10-ft. radius
405 CRAWLER	(1-Yd.)	40,000 lbs.	40-foot boom at 12-ft. radius
605 CRAWLER	(1½-Yds.)	72,300 lbs.	50-foot boom at 12-ft. radius
1005 CRAWLER	(2½-Yds.)	159,000 lbs.	50-foot boom at 12-ft. radius

KOEHRING COMPANY, Milwaukee 16, Wis.

(Crawler ratings based on 75% of tipping load. Rubber-tired machines — 85% of tipping load.)

CX633

Rolling COOKSON Doors

Best Way* to Close an Opening!

Cookson steel or aluminum Rolling Service Doors and Servire Fire Doors

*Protection against weather, fire and entry

Cookson steel or aluminum Rolling Grilles

*Protection with full visibility and ventilation

Cookson extruded aluminum Counter Doors

*Protection with permanent beauty and utility

The Finest Door Costs No More! Engineered to the job — power or manually operated. Send for latest Bulletin or see our catalog in Sweet's.

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THE COOKSON COMPANY
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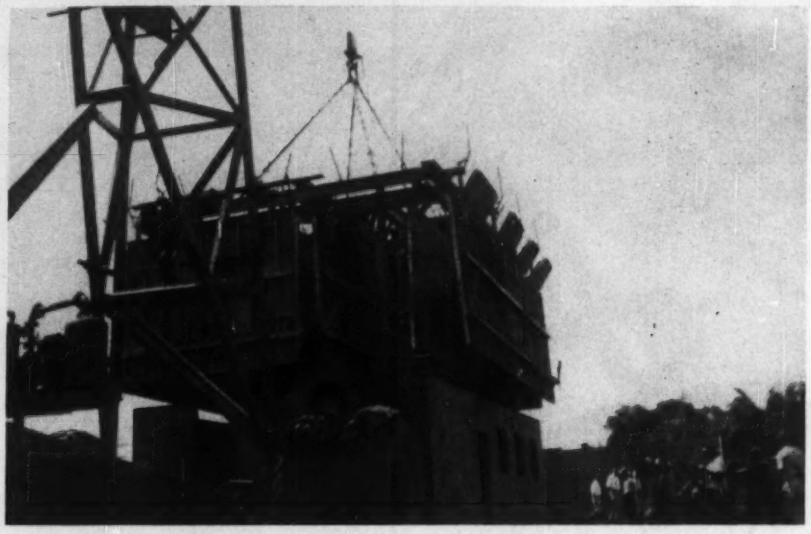
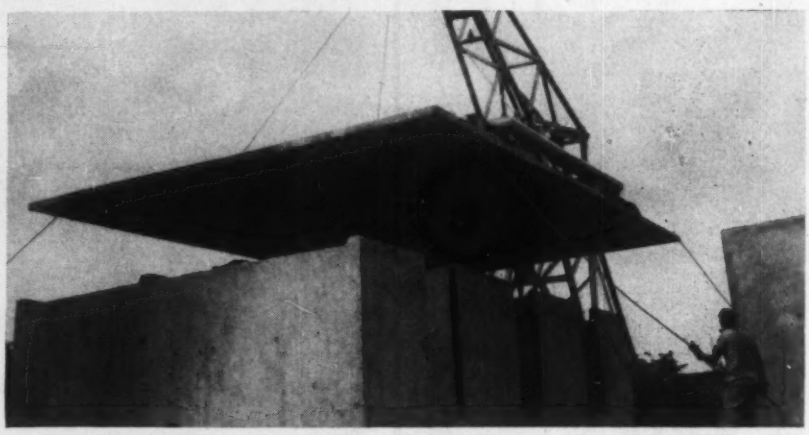
. . . Puerto Rico Housing



Now the Big Form Weighing 32½ tons and including all door and window openings, walls, has been placed, concrete cast, and stripped. Special mobile crane, with 50 ton lift, does work. Walls are 5 in. thick, ceiling heights 9 ft. Common laborers get 40 to 60 cents an hour.



Then the Roof A completely flat, reinforced, 22½ ton slab, roughly 30 ft x 24 ft and 4 in. thick, is placed by another crane. Metal plates cast into underside of slab are welded to points atop walls. Construction techniques were originally developed for Ibec six years ago (ENR Nov. 17, 1949, p. 32), adapted for this use.

And Here's the Show A completed street of the $6,000 to $6,200 houses, each (depending on model) 685 or 705 sq ft containing three bedrooms, kitchen, living room, on plot about 37 x 85 ft. Contractor also supplies paved streets, sewage disposal plant, street lights, utilities. Aluminum louvers cover window openings, special woods for doors.

COUNT ON YOUR WICKWIRE ROPE DISTRIBUTOR FOR ENGINEERING ASSISTANCE

When it's a question of wire rope, the place to go is to your Wickwire Rope distributor. He knows your requirements. He knows wire rope and how it can be used to best advantage. In addition, he can provide you with this important extra—the technical assistance of Wickwire Sales Engineers. With the additional help of these capable specialists, he can give you expert, practical advice on even the toughest wire rope problems.

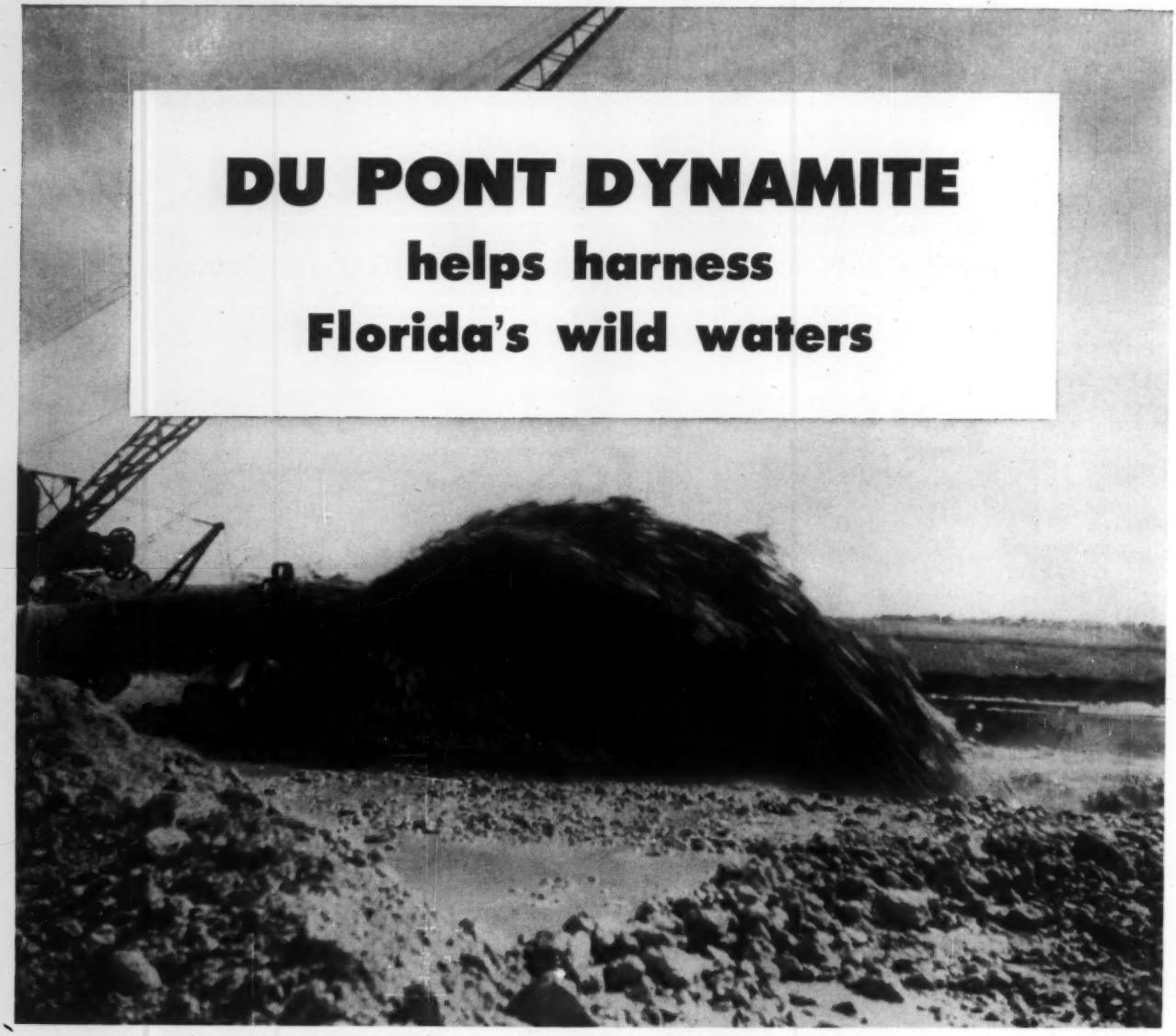
Your Wickwire Rope distributor is a good man to know. He's quality people handling quality products. Buy your wire rope and wire rope slings from him. You'll find that the many valuable services he offers far outweigh any apparent price advantage you might gain by buying direct.

CF&I WICKWIRE ROPE A CF&I PRODUCT

A PRODUCT OF THE COLORADO FUEL AND IRON CORPORATION

3150

DU PONT DYNAMITE
helps harness Florida's wild waters



Mud and broken rock are scooped from canal by a giant hydraulic dredge and spewed out to form a levee. A year earlier, the material was drilled from an amphibious drill barge. Du Pont 60% "Hi-Velocity" Gelatin dynamite was used to shatter the limestone into pieces small enough to be inhaled by dredge's respiratory system.

More than 1,300,000 lbs. of 60% "Hi-Velocity" Gelatin used in one section of $300,000,000 drought- and flood-control project

Dig a ditch in some parts of water-rich Florida and you've got a canal. For two years now the Gahagan Construction Corporation of New York has been constructing a 16-mile ditch for a canal-levee system in Florida's vast, multimillion-dollar flood-control project.

On this job it was necessary to drill and shoot far in advance of excavation. They had to be certain that the rock would be well shattered when the dredge moved in. Because of these unusual conditions the contractor selected Du Pont 60% "Hi-Velocity" Gelatin. Results have fully justified their choice. As many as 450 holes at a time were fired electrically, producing two to two and one-half tons of broken limestone per pound of explosive. More than a million and one-third pounds of 60% "Hi-Velocity" Gelatin were consumed in completing this strip of canal.

60% "Hi-Velocity" packs quite a wallop . . . even when detonated under high heads of water. It's the natural choice when a dynamite is needed for unusually tough, wet jobs.

Among the wide selection of Du Pont dynamites you'll find the right combination required in your particular blasting work. Just contact the Du Pont Explosives representative in your area. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

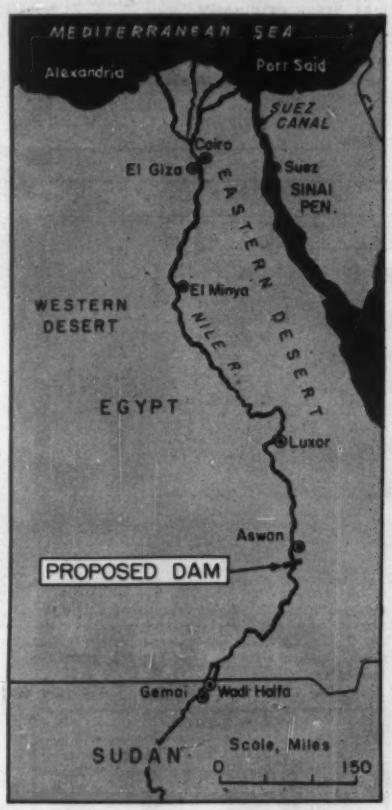
Egypt's "High Dam"

Plans for huge dam to be built south of Aswan move ahead . . . but slowly

Somewhere around 3000 BC, Egypt built the Pyramids, one of the most gigantic undertakings of early history. Today, the young republic is planning another tremendous venture—the construction of the world's largest rockfill dam. Detailed planning is now under way and financing appears imminent.

The dam, according to present plans, will be 3 mi long and 365 ft high and will create a reservoir containing more than 100 million acre-feet. This storage volume is approximately five times the annual discharge of the Nile and is four times the capacity of Lake Mead behind Boulder Dam. Cost is estimated at nearly $600 million and the construction program will take ten years to complete. However, this is just the cost of the dam. To construct the pipes and canals to distribute irrigation water and to erect transmission lines for the generated power, another $600 to $900 million will have to be spent.

Construction of the dam will require the drilling of seven 54-ft dia tunnels through the east bank to divert the river. Another four tunnels will be drilled in the west bank for power generation. These tunnels have been designed to serve ultimately four sets of turbine generators with a capacity of 320,000 kw per set. Initially only two sets will be installed with the others to be added as required.



• Consulting engineers appointed—The most recent development in this project, which began officially in late 1954, is the appointment of the British firm of Sir Alexander Gibb and Partners to proceed with detailed planning. Prior to this appointment and at present, model tests are being conducted in a hydraulic laboratory at Grenoble, France.

• Financing no small problem—At present, no specific financing arrangement has been reached, but the attitude of the International Bank for Reconstruction and Development, principal lenders considering the program, is far from pessimistic. In an interview with our Cairo correspondent, the Bank's Middle East representative, Mr. Dorsey Stephens, indicated that, "Things are taking their normal course," and denied the Egyptian allegation that Britain and the U.S. are bringing pressure on the Bank to delay such a loan.

• Offers from the Communist sphere—Russia has offered to help finance the project and Hungary and East Germany have said they are ready to supply engineers, machinery and electrical equipment in exchange for agricultural commodities. However, the offer of financial assistance from the Soviet is reported to have been contingent on the placement of contracts with Russia.

Egypt's Premier Nasser is expected to place some contracts with the Communists in order to assert Egyptian independence and to avoid losing the bargaining position with the West obtained through the arms deal negotiated with the Soviets.

• Project's "Cold War" no contest—But despite the Soviet offers made and expected placement of token contracts, it appears doubtful that the dam will be built with rubles rather than with dollars or pounds.

With the appointment of the British consulting engineers, the way begins to clear for more rapid action by the Bank. A main obstruction to action has been the lack of a firm design—a committee of American, French and West German experts has al-

THE
Bullard-
Burnham
SAFETY
HOOK

At last a 100% safe hook for every type of hoist and puller. The pushbutton safety gate automatically locks closed, yet opens instantly with a touch of the finger. The safety gate also acts as an indicator to warn operators if the hook is even slightly sprung. Bullard-Burnham hooks are available in sizes #2 - #16A.

With gate open the hook's throat is entirely free.

Write for technical bulletin No. 278.

EVERYTHING BULLARD IN SAFETY

see our catalog in PLANT ENGINEERING FILE

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E. D. BULLARD COMPANY
275 Eighth St., San Francisco

THIS COUPON BRINGS YOU NEWEST DATA ON INTERNATIONAL-ENGINEERED DOORS

INTERNATIONAL STEEL COMPANY
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Send me without obligation my personal copy of the new 1956 International Doors for Industry and Aviation.

NAME AND POSITION_____

FIRM_____

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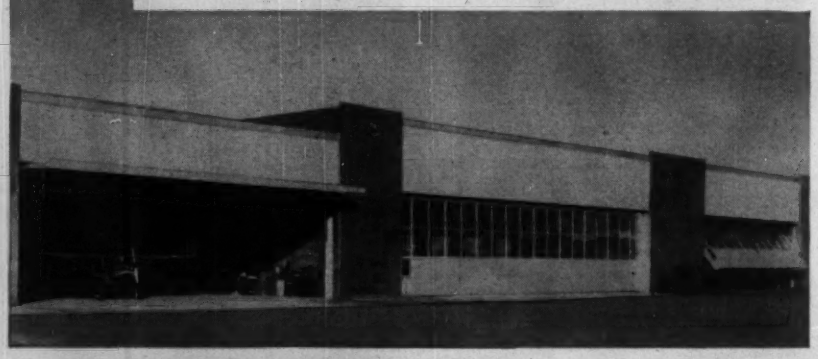
CITY_____ ZONE____ STATE_____



Cessna AIRCRAFT COMPANY

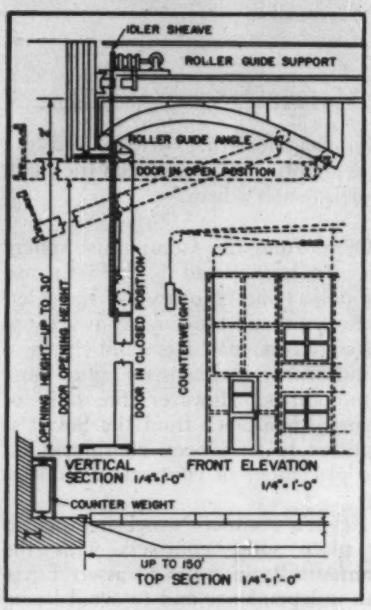
INTERNATIONAL - BUILT TURNOVER CANOPY DOORS: three 60' x 19' and one 90' x 19'. General Contractor: VOLLMER CONSTRUCTION COMPANY, Wichita, Kansas, for CESSNA AIRCRAFT COMPANY, Wichita, Kansas.

newest addition to the famous names served by

INTERNATIONAL HANGAR DOORS

International installations at Cessna mark the newest such entrance completed for a major aircraft manufacturer . . . ranging in size up to the world's largest.

For Cessna the problem was similar to that for other manufacturers supplied by International — building a door that would provide a tight closure; operate easily in all weather; and could be produced economically. International's experience with every type of aviation door resulted in Cessna selecting those illustrated. The growing list of leading names served by International Doors, in aviation and in all industries, merits your consideration when planning a structure demanding doors engineered to provide the most efficient entrance . . . most economically. See Sweet's Architectural File.



The above detailed drawing of a typical International Turnover Canopy Door illustrates its special suitability for small to medium openings — where floor space and interior clearance are limited. Door rises vertically, then swings out and up, with approximately 50% of door height projecting outside as a canopy. Offers extra protection against bad weather. Always clear of usable floor space in opening or closing.

INTERNATIONAL SERVICE

2056 EDGAR ST. • EVANSVILLE 7, INDIANA

INTERNATIONAL STEEL COMPANY

ready established the technical feasibility of the project and broad plans drawn by Swedish hydro engineers have been approved.

• **Sudanese silent**—Another major obstruction in the way of the financing set-up is the lack of an agreement with the Sudan.

The reservoir which will be created by the dam will be about 400 mi long and will extend about 150 mi into Sudan territory—if an agreement can be reached. The Egyptian government is still awaiting an official reply to an offer made to the Sudanese last May. The offer was a revision of the 1929 agreement on division of Nile waters and guaranteed that net benefit from the dam be divided equally between the two countries at the main points of distribution. That is, if Egypt withdrew a given quantity at Aswan, the Sudanese would be entitled to withdraw the same quantity at a dam within their borders.

According to the Egyptians, this would mean that the Sudan would get twice the amount of water that they are now using.

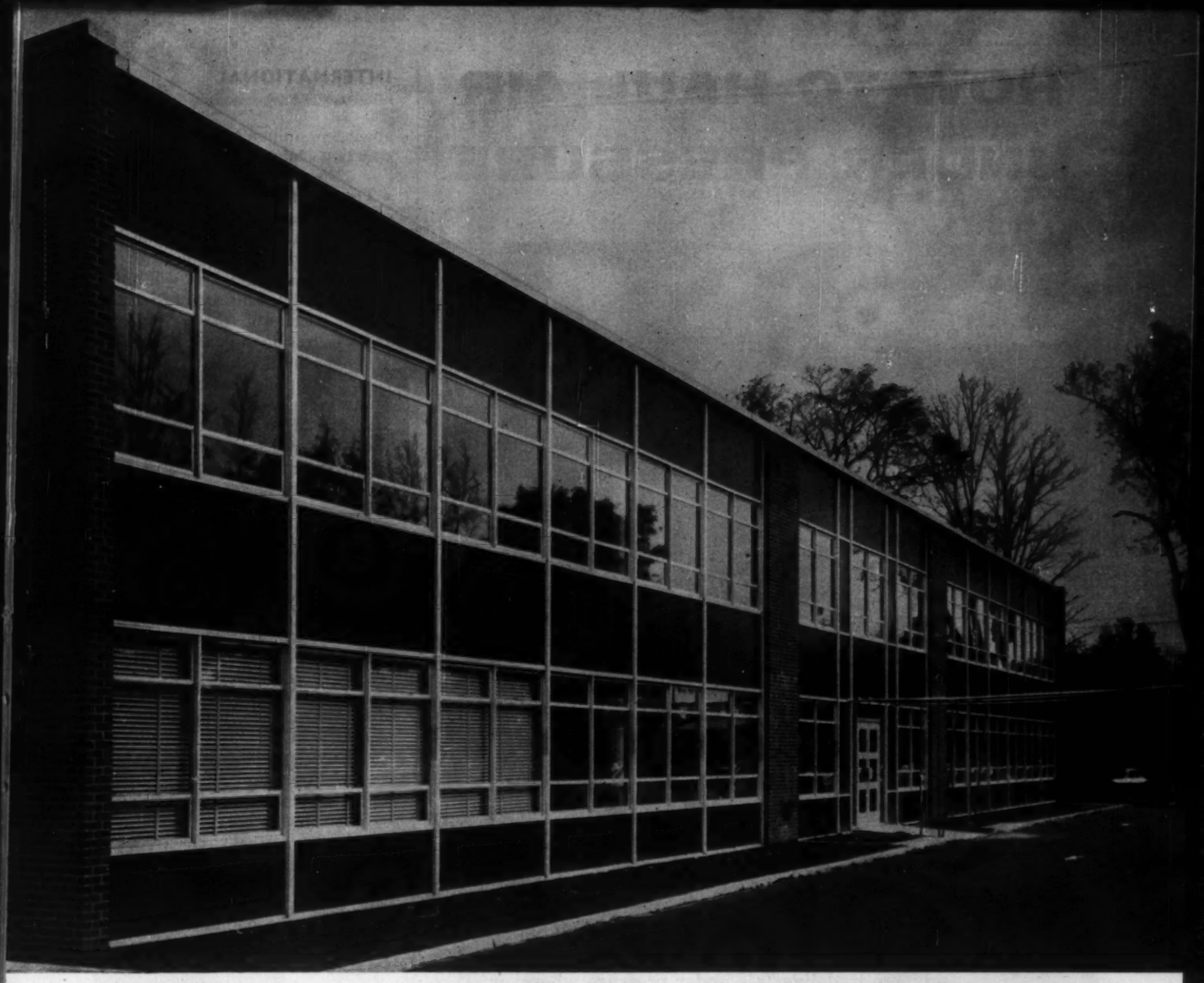
The main objection of the Sudanese is that the Egyptian proposal splits the take of water before evaporation is taken into account. It is alleged that 7½ million acre-feet would be lost through evaporation each year.

• **A third, most difficult obstruction**—Before the Bank can proceed it will be necessary for Egypt to work out an economic plan for the next ten years that would concentrate the country's domestic resources on the dam's construction.

This has been termed the most difficult point since the impact of such a tremendous engineering and construction project could easily shatter the small and weak economy of Egypt unless control could be effectively exercised. Between one half and two thirds of the cost of the dam would be paid for by Egypt and if the republic should undertake other expensive enterprises at the same time maintenance of the Egyptian share would be impossible.

In the initial financing of the dam it is estimated that the World Bank would put up about $110,000 and Egypt would contribute $50 to $80 million. A European combination of British, French, Belgian and West German suppliers of equipment is expected to offer an amount approximating the Egyptian offer.

Furthermore, the U. S. has stated a willingness to divert the main part of its present Egyptian aid program of



Mathilde Steinam, Stella S. Housman Wing, Monmouth Memorial Hospital, Long Branch, N. J. Architects: Ferrenz & Taylor, New York City. Contractors: Chas. B. Hembling & Son, Red Bank, N. J. Lupton Curtain-Wall System Type G. Width Modules: 8'8". Ventilators project in and project out, with fixed glass between. Opaque Panels: outside, blue-green porcelain enamel flecked with lighter spots, etched aluminum inside. Opaque panels are insulated — made of two components with air space between for drainage. Outside component is sandwich construction with aluminum Honeycomb core. Inside component is 1" Fiberglas cemented to aluminum sheet.

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about $40 million annually to the construction endeavor.

• **The benefits of the dam**—The effect of the dam on the Egyptian economy would be so far reaching as to be almost unpredictable. In terms of physical quantities, the dam will provide enough additional water to reclaim 2 million acres of presently untilled land—increasing the nation's cultivated area by a third. For industry, the dam and its proposed underground power house will provide more than a million kilowatts of electricity. In all, economists estimate that the dam will add nearly two-thirds of its initial cost or $450 million to the national income.

At present, the waters of the Nile are controlled by a system of small dams and barrages, but their design and size is such that they cannot handle the heavy amount of silt that comes down during the August floods. When the floods arrive, the sluices are opened and the silt and water are wasted to the sea.

The high dam would however eliminate this waste. Solid construction and allowance for silting in the reservoir would permit storage and utilization of all the waters flowing from the upper Upper Nile and its tributaries.

The construction of the dam would also have a favorable effect on power generating facilities already constructed along the course of the river. The existing Aswan Dam and power plant located a few miles downstream from the site of the High Dam would be particularly benefited.

• **Egyptian action to date**—The Egyptian government has set up an independent organization, called the Saad-el-Aali Authority that, like the TVA, will go ahead with the project unhampered by political considerations. Chairman of the authority is Wing Commander Hassan Ibrahim, a member of Premier Nasser's military junta. Other members of the authority include Egypt's foremost engineers and members of the National Production Council. Working with the authority is an international panel of experts made up of representatives of British, German, and French engineering firms.

• **Construction planning**—The authority has indicated that the dam will be built in at least two stages. The first stage will see the construction of a "temporary" dam which will serve as the nucleus for the large structure. Cost of this stage is estimated at $110 million and will take about five years to complete.

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Teams like this represent a special, yet typical, Westinghouse service—readily available to the construction industry.

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Check the next two pages. There you'll see a specific example of how Westinghouse teams are serving people like you in the construction industry. J-94026

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YOU CAN BE SURE...IF IT'S Westinghouse

Westinghouse coordinated substation is arranged for flexibility and economical expansion. An extra bay and transformer can be added easily whenever additional feeders may be required.

Houston water purification plant, Houston, Texas. Architects and Engineers: Freese, Nichols & Turner. General Contractors: Brown & Root, Inc.—all of Houston, Texas.

Westinghouse indoor metal-clad switchgear provides positive protection for the entire electrical system through its drawout air circuit breakers. Matched unit construction assures economical expansion.

This Westinghouse control center simplifies motor operation by grouping all controls for 57 motors. There are three such control centers. All units can be easily rearranged or expanded.

FACT:

They engineered an electrical system that anticipates future expansion

flexible design of Westinghouse apparatus permits installed horsepower to more than double

Problem: At the *City of Houston* water purification plant, the possibility of a 100% increase in installed horsepower over the next few years made flexibility a major requirement when the electrical system was engineered.

Solution: An electrical system containing Westinghouse apparatus that has the inherent flexibility to meet tomorrow's expansion plans.

Results: From the coordinated outdoor substation to the indoor switchgear and control centers, future electrical needs have been anticipated. Each Westinghouse component features modular construction. Each permits additions or changes . . . easily and economically . . . as power requirements dictate.

For the full story, call *The Man With The Facts* . . . the construction sales engineer at your nearby Westinghouse office. J-94047-A

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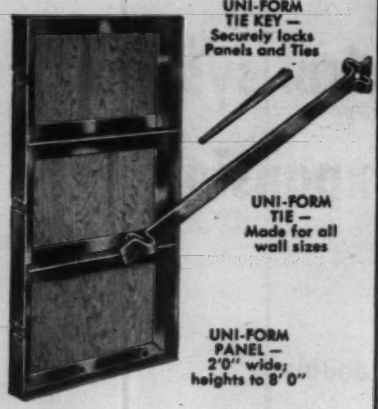

UNI-FORM Concrete Forms are prefabricated steel-framed, plywood faced panels . . . ready to use when they reach the job.
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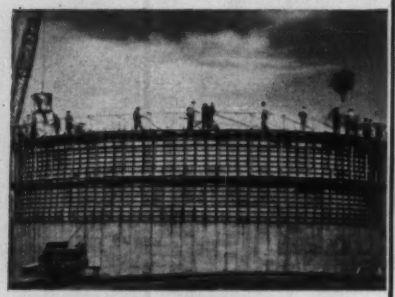

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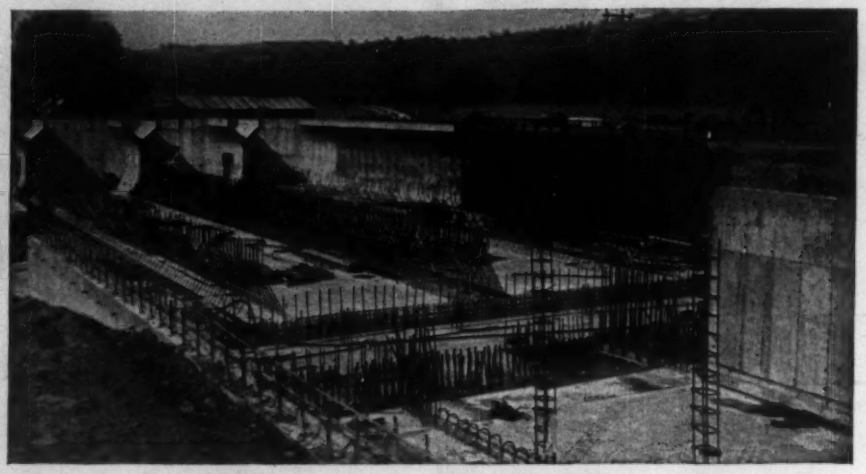
Unique Prefab Form System Speeds Sewage Plant "Y" Wall Construction



MECHANIZED FORMING with new "Y" wall trusses and UNI-FORM Panels speeds construction, saves labor and material

Field reports on a new system for forming "Y" walls in aeration tanks and settling basins indicate very satisfactory operation and important labor and material saving advantages for the system.

Developed by the Universal Form Clamp Co., Chicago, the new system is said to completely eliminate the many problems and difficulties encountered by contractors in forming this special type of wall in sewage disposal plant construction.

Specially designed trusses, which can be made to handle any type, height, shape or wall thickness, are used in conjunction with standard UNI-FORM Concrete Forms to form the "Y" wall. Assembly of the truss and UNI-FORM Panels into a complete form, ready to receive concrete is a fast, mechanical operation. Positive internal spreading and accurate wall thicknesses are assured by the use of Universal Spiroloc Cone Nut Assemblies.

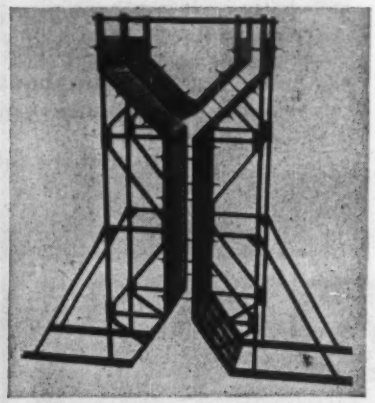
Features incorporated in the design and operation of the Universal "Y" wall forming system eliminate the necessity of additional lumber or tying devices for the alignment and bracing of the unit.

STRIPPED WALLS are clean and accurate

Erection, stripping and movement of the form can be handled either as individual pieces or as a large unit. Both methods have been very successfully used on recent projects.

Because standard UNI-FORM panels are used to form a large percentage of the "Y" wall contact area, it is possible to strip all UNI-FORM panels within a very short time after the actual pouring of concrete, leaving the trusses in place to provide the necessary support for the required period of time.

In this way, faster forming cycles, using minimum UNI-FORM equipment are possible, resulting in lower labor and material costs. UNI-FORM Panels are rented or sold, or rented with an option to purchase.



ASSEMBLED SECTION of "Y" wall truss with UNI-FORM Panels

For complete details on Universal "Y" wall forms and UNI-FORM Panels, Write:

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30-DAY OUTLOOK of the Weather Bureau for the period from mid-November to mid-December calls for temperatures to average below seasonal normals over most of the area west of the Mississippi, with greatest departures in the Northwest. Above normal temperatures are indicated in Florida and northern New England and near normal elsewhere.

Precipitation is expected to be subnormal in the Pacific Northwest, along the South Atlantic Coast, and in the far Southwest. In the remainder of the country near or above normal amounts of rain and snow are indicated.

Observed weather in 20 cities, compared with normals

City	Precipitation, inches: Oct. 1955	Departure fr. normal	10 Mos. 1955	Departure fr. normal	Temperature, degrees: Oct. 1955	Departure fr. normal	Av. daily maximum	Av. daily minimum
Atlanta	1.17	−1.43	32.64	−8.56	61.9	−1.5	72.8	51.0
Baltimore	5.66	+2.29	42.59	+5.89	58.3	+1.8	70.1	46.4
Birmingham	3.73	+0.87	40.02	−4.27	61.4	−2.3	75.2	47.5
Boston	6.94	+4.15	49.79	+17.89	55.1	+0.1	62.2	47.9
Chicago	5.36	+2.80	28.97	+0.53	55.5	+1.4	65.2	45.7
Cincinnati	4.70	+2.51	42.94	+9.50	56.8	−0.6	67.4	46.2
Cleveland	5.88	+3.46	35.71	+8.58	54.8	+0.4	64.5	45.1
Dallas	0.82	−1.85	21.31	−8.06	68.4	−0.4	81.9	54.9
Denver	0.32	−0.70	10.92	−1.29	55.3	+2.3	69.3	41.2
Detroit	4.45	+2.16	22.44	−4.21	55.3	+2.4	64.2	46.3
Kansas City	2.78	−0.15	30.22	−1.42	60.0	+0.4	71.0	49.0
Los Angeles	T	−0.50	9.10	−0.76	64.2	−2.4	72.8	55.5
Minneapolis	2.21	+0.56	18.81	−3.61	51.4	+1.0	61.3	41.5
New Orleans	1.32	−2.34	62.28	+7.33	71.6	−1.2	79.5	63.6
New York	7.61	+4.57	38.37	+2.50	59.7	+2.7	66.2	53.2
Philadelphia	4.53	+1.93	31.62	−3.76	59.1	+2.5	69.0	49.1
Pittsburgh	3.27	+0.78	32.18	+0.75	56.3	+0.4	65.7	46.9
St. Louis	4.27	+1.37	30.53	−2.17	58.9	−1.7	68.2	49.5
San Francisco	0.03	−1.04	7.12	−6.56	59.7	−1.3	66.7	52.6
Seattle	5.33	+2.25	19.80	−2.32	53.0	−1.4	58.5	47.5

T traces (less than 0.005 inches)

Precipitation range in 20 cities, in inches

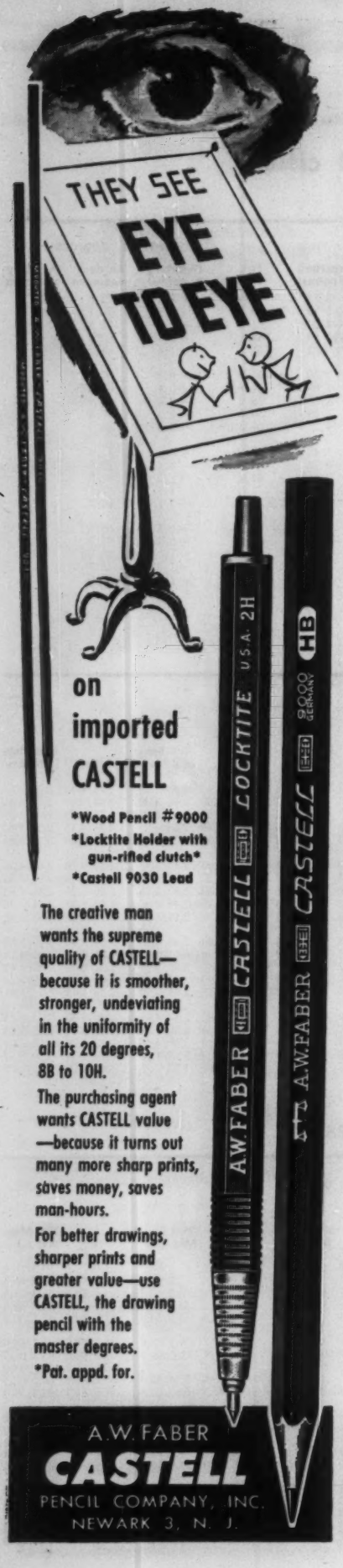
Table shows range observed 33.3% of time. Rainfall heavier 33.3% of time.
Computed by U. S. Weather Bureau (based on historical records of actual precipitaion)

City	Nov.	Mid Nov.-Mid Dec.	Dec.	Mid Dec.-Mid Jan.	Jan.	Mid Jan.-Mid Feb.	Feb.	Mid Feb.-Mid Mar.	Mar.	Mid Mar.-Mid Apr.	Apr.	Mid Apr.-Mid May	May	Mid May-Mid June
Atlanta	2.43/3.85	2.94/4.58	3.46/5.30	3.42/5.32	3.39/5.33	3.28/5.50	3.36/5.67	3.40/6.00	3.42/6.33	3.12/5.72	2.82/5.10	2.48/4.72	2.14/4.33	2.50/4.38
Baltimore	1.56/3.12	1.99/3.43	2.41/3.73	2.59/3.85	2.77/3.96	2.57/3.68	2.36/3.39	2.48/3.76	2.59/4.13	2.59/4.17	2.58/4.20	2.76/4.30	2.94/4.40	2.73/4.42
Birmingham	2.17/3.91	2.95/4.83	3.71/5.75	3.75/5.58	3.75/5.40	3.61/5.64	3.47/5.88	4.18/6.26	4.48/6.63	3.91/5.85	2.94/5.07	3.05/4.81	3.16/4.55	2.90/4.70
Boston	2.74/4.46	2.72/4.33	2.89/4.20	2.83/4.12	2.39/3.45	2.70/3.99	2.64/3.93	2.12/3.58	2.94/4.50	2.66/4.45	2.39/4.40	2.58/4.29	2.78/4.18	2.42/3.84
Chicago	1.59/2.80	1.46/2.62	1.32/1.45	1.30/2.28	1.29/2.10	1.40/2.16	1.52/2.23	1.76/2.67	1.99/3.11	2.09/3.12	2.19/3.13	2.24/3.56	2.16/4.00	2.29/3.83
Cincinnati	1.99/3.67	2.14/3.48	2.29/3.28	2.32/3.54	2.34/3.80	2.07/3.40	1.80/3.00	2.10/3.64	2.39/4.29	2.26/3.94	2.34/3.60	2.42/3.85	2.49/4.10	2.59/4.30
Cleveland	1.82/2.77	1.76/2.68	1.70/2.56	1.65/2.58	1.59/2.60	1.55/2.52	1.51/2.43	1.81/2.71	2.10/2.98	2.15/3.13	2.20/3.27	2.27/3.38	2.33/3.49	2.17/3.53
Dallas	1.64/3.00	1.36/3.00	1.09/3.00	1.24/3.05	1.39/3.10	1.49/2.70	1.59/2.30	1.96/3.08	2.34/3.86	2.50/4.68	2.66/5.50	2.82/5.38	2.99/5.25	2.39/4.85
Denver	0.29/0.68	0.34/0.72	0.39/0.77	0.28/0.64	0.19/0.50	0.26/0.54	0.34/0.58	0.46/0.84	0.59/1.10	0.96/1.75	1.34/2.40	1.48/2.65	1.62/2.90	0.64/2.32
Detroit	1.77/2.78	1.70/2.66	1.64/2.60	1.63/2.50	1.62/2.40	1.56/2.45	1.51/2.50	2.14/2.64	1.77/2.78	1.78/2.75	1.79/2.73	2.14/3.20	2.49/3.67	2.66/3.88
Kansas City	1.27/2.35	1.02/1.95	0.77/1.55	0.68/1.48	0.59/1.42	0.80/1.66	0.99/1.90	1.29/2.40	1.59/2.90	1.99/3.15	2.39/3.40	2.82/4.40	3.24/5.40	3.42/5.82
Los Angeles	0.26/1.30	0.70/2.00	1.14/2.70	1.19/3.00	1.24/3.30	1.12/3.25	0.99/3.20	1.06/3.08	1.13/2.95	0.68/1.92	0.22/0.90	0.14/0.62	0.05/0.35	0.02/0.18
Minneapolis	0.67/1.57	0.62/1.44	0.57/1.30	0.60/1.19	0.64/1.08	0.58/1.08	0.52/1.08	0.75/1.38	0.98/1.67	1.34/2.14	1.69/2.60	2.16/3.29	2.64/3.98	2.89/4.49
New Orleans	2.69/4.67	2.96/4.92	3.24/5.17	3.36/5.28	3.49/5.40	3.14/5.05	2.79/4.70	3.00/5.00	3.22/5.30	2.94/5.15	2.66/5.00	2.65/5.12	2.64/5.25	3.18/5.88
New York	2.21/3.95	2.42/3.86	2.64/3.77	2.55/3.71	2.46/3.65	2.41/3.88	2.36/4.10	2.35/4.08	2.34/4.05	2.40/3.92	2.47/3.78	2.50/3.90	2.54/4.02	2.45/3.91
Philadelphia	2.36/3.50	2.50/3.70	2.64/3.90	2.60/3.80	2.57/3.70	2.57/3.69	2.57/3.68	2.60/3.84	2.62/4.00	2.56/3.91	2.49/3.82	2.44/4.11	2.39/4.40	2.54/4.25
Pittsburgh	1.84/2.72	1.96/3.00	2.09/3.27	2.12/3.20	2.14/3.13	1.96/2.98	1.77/2.83	2.06/3.15	2.34/3.47	2.32/3.44	2.29/3.40	2.39/3.58	2.49/3.75	2.68/3.98
St. Louis	1.86/3.30	1.70/3.05	1.64/2.80	1.52/2.75	1.39/2.70	1.48/2.80	1.57/2.90	1.92/3.42	2.27/3.95	2.43/2.88	2.59/4.10	2.86/4.65	3.13/5.20	2.95/5.25
San Francisco	2.04/3.30	1.62/4.28	2.19/5.25	2.34/5.12	2.49/5.00	2.24/4.86	1.99/4.71	1.96/4.13	1.94/3.55	1.30/2.54	0.64/1.54	0.44/1.12	0.18/0.69	0.09/0.37
Seattle	3.82/5.60	4.00/5.74	4.17/5.89	4.14/5.57	4.12/5.25	3.34/4.92	2.55/4.60	2.18/4.02	1.81a2.43	1.72/3.16	1.64/2.90	1.53/2.45	1.42/2.00	1.09/1.86

Mean temperature range in 20 cities, in degrees F.

Table shows range observed 25% of time. Mean temperature higher 37.5% of time, lower 37.5% of time.
Computed by U. S. Weather Bureau (based on historical records of actual temperature)

City	Nov.	Mid Nov.-Mid Dec.	Dec.	Mid Dec.-Mid Jan.	Jan.	Mid Jan.-Mid Feb.	Feb.	Mid Feb.-Mid Mar.	Mar.	Mid Mar.-Mid Apr.	Apr.	Mid Apr.-Mid May	May	Mid May-Mid June
Atlanta	51.1/52.7	46.6/48.4	44.0/46.0	48.3/50.3	43.5/45.5	44.0/46.4	45.1/47.9	47.5/50.1	51.2/53.6	55.9/58.0	60.9/62.6	64.9/66.5	69.0/70.5	73.5/74.6
Baltimore	45.6/47.0	40.2/42.0	35.8/37.8	34.2/36.1	33.9/35.7	33.2/36.0	34.6/38.0	38.1/41.7	42.0/45.7	48.6/49.4	51.9/53.6	57.5/59.0	63.4/64.6	68.2/69.5
Birmingham	50.7/53.2	46.5/48.9	44.3/46.5	43.4/46.1	43.5/46.5	44.4/47.6	46.0/49.4	48.8/51.7	52.4/54.7	56.6/58.5	61.1/62.6	64.5/66.2	68.4/70.2	72.4/74.5
Boston	43.6/45.6	36.8/39.2	31.2/34.0	28.9/31.9	30.3/31.2	26.4/29.6	27.8/30.0	31.4/34.0	3.56/38.6	41.1/43.3	46.7/48.3	51.5/53.1	56.7/58.4	56.8/58.6
Chicago	38.6/41.5	31.2/35.0	28.7/30.3	23.7/28.5	23.2/28.1	23.1/28.1	24.7/30.7	29.2/31.2	34.6/39.1	40.9/42.8	47.5/48.8	52.9/54.8	57.9/60.5	63.1/66.1
Cincinnati	42.0/44.5	35.9/39.1	31.4/35.2	30.1/34.4	20.8/34.6	29.9/34.4	31.6/36.0	35.2/39.2	39.6/43.1	45.4/48.1	51.4/53.3	56.4/58.6	61.5/64.0	66.7/68.9
Cleveland	40.5/42.7	34.3/37.2	29.3/32.9	27.3/30.9	26.9/30.5	26.0/29.6	26.2/29.7	29.8/33.7	34.7/38.8	40.3/43.2	46.2/47.8	52.8/53.9	57.9/60.3	63.5/65.7
Dallas	54.3/56.7	49.9/52.3	47.0/49.3	44.8/48.1	44.1/47.5	45.8/49.2	48.8/52.2	51.9/55.6	55.5/59.6	60.1/64.0	64.2/67.3	68.4/71.1	72.8/75.0	77.2/78.8
Denver	38.0/41.4	33.5/36.7	30.5/33.5	28.3/31.4	27.0/30.0	27.9/31.5	30.5/34.7	33.1/36.8	35.9/39.1	40.4/43.2	46.3/48.6	51.1/53.4	55.2/57.4	60.0/62.1
Detroit	39.2/41.1	32.9/35.3	27.9/30.9	25.6/28.5	24.8/27.7	24.2/27.8	24.6/28.9	27.9/32.1	33.1/37.2	39.3/42.1	45.6/47.1	51.0/52.8	56.5/58.7	62.3/64.4
Kansas City	42.6/45.9	36.7/40.1	32.4/35.9	30.4/33.0	30.0/31.9	30.2/33.6	32.2/37.1	37.3/41.2	42.9/45.9	48.6/51.2	54.9/56.7	59.9/61.7	64.6/66.4	69.4/71.2
Los Angeles	57.9/59.8	56.5/58.2	54.9/56.5	53.4/54.8	52.7/54.0	53.6/54.3	52.9/55.1	54.1/56.3	55.4/57.4	56.6/58.4	58.1/59.7	59.8/61.3	61.4/62.8	63.0/64.0
Minneapolis	30.9/36.0	24.5/28.1	17.2/22.3	13.8/18.4	13.4/16.5	13.3/17.7	15.0/20.8	21.7/25.9	29.9/32.5	37.3/39.5	44.7/47.9	51.3/54.4	57.2/60.2	62.2/64.9
New Orleans	59.0/61.5	56.0/58.5	54.6/56.8	53.2/56.0	52.6/56.0	54.0/57.4	55.9/59.3	57.6/60.8	60.6/63.0	64.3/65.7	67.4/69.1	70.7/72.1	73.8/75.1	77.0/78.3
New York	46.5/47.9	40.2/42.3	34.6/37.5	34.5/35.2	32.4/34.6	30.9/33.6	30.9/33.6	34.1/36.8	38.7/41.3	43.6/46.0	49.0/51.0	54.6/56.3	60.6/62.1	65.9/67.5
Philadelphia	45.3/47.2	39.9/42.0	35.1/37.3	32.7/35.4	31.8/35.0	31.1/34.3	32.3/35.3	36.4/39.2	40.8/43.5	45.6/47.9	50.8/52.6	56.2/58.0	62.3/64.0	67.5/69.2
Pittsburgh	40.3/42.0	34.0/36.4	29.5/32.6	24.8/28.0	26.9/30.1	26.4/30.5	26.9/32.0	30.5/35.4	36.0/40.6	43.9/46.5	48.0/49.8	53.1/55.1	58.7/60.9	63.5/65.8
St Louis	43.6/46.9	37.6/41.2	33.3/37.1	30.9/35.1	30.1/34.7	31.3/35.7	33.7/38.1	37.8/41.8	42.9/46.3	48.6/51.5	54.5/57.0	60.2/63.3	64.0/66.6	68.7/71.5
San Francisco	53.8/55.0	50.7/52.3	48.7/50.2	47.1/48.9	46.9/49.1	48.3/50.8	50.0/51.7	51.0/52.7	51.7/53.5	52.4/54.2	53.2/55.0	54.3/55.9	56.9/57.4	57.5/60.1
Seattle	43.1/44.5	41.0/42.4	39.4/40.7	37.7/39.0	30.2/38.5	38.2/40.0	39.7/42.0	41.7/43.3	43.6/44.7	45.6/47.2	48.2/49.9	51.0/52.9	54.2/56.3	56.9/58.5


THEY SEE
EYE
TO EYE
on
imported
CASTELL
*Wood Pencil #9000
*Locktite Holder with
gun-rifled clutch*
*Castell 9030 Lead
The creative man wants the supreme quality of CASTELL—because it is smoother, stronger, undeviating in the uniformity of all its 20 degrees, 8B to 10H.
The purchasing agent wants CASTELL value—because it turns out many more sharp prints, saves money, saves man-hours.
For better drawings, sharper prints and greater value—use CASTELL, the drawing pencil with the master degrees.
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A.W. FABER
CASTELL
PENCIL COMPANY, INC.
NEWARK 3, N. J.

NEW PRODUCTS

Aluminum in Color is Now Available for Building Use

The time when aluminum may be ordered by fabricators in all colors of the rainbow, direct from the mill, has arrived. Alcoa plans to offer a complete line of color anodized aluminum sheet, tube, extruded shapes and fasteners.

Blue, green, yellow, gray, brown, gold and black metallic finishes can now be ordered on sheet, extruded shapes, rod, bar and on drawn and extruded tube, and shade variations of the standard colors will also be made available.

The new colored aluminum products can be supplied for both indoor and outdoor use. Two general classes of color anodized finish are involved. These are Decorative Color Finish and Architectural Color Finish.

The Decorative Color Finishes available are designed for both interior and exterior application. The Architectural Finishes are designed primarily for exterior service. Both general classes, Architectural and Decorative are supplied in all extruded forms and in flat sheet including pattern sheet. The Decorative finishes are also supplied in coiled sheet. ALUMINUM COMPANY OF AMERICA, 769 ALCOA BLDG., PITTSBURGH 19, PA.

Concrete Gunning Rig Redesigned for Flexibility

A new portable concrete gunning rig is said to have a number of new features which increase the completeness, capacity and flexibility of the unit.

The rig is made up of three basic pieces of equipment used in concrete gunning operations, the concrete gun, the automatic proportioning, dry mixing and elevating machine; and a sand loader. The sand loader operates from a power take-off from the drive mechanism of the mixer-elevator.

The gun has greater capacity—2 to 8 cu yds per hour—than was previ-

32-Yd Units Designed For Heavy Hauls

The first six units of a new truck-tractor with dumping semi-trailer have been delivered to the Isbell Construction Co. of Reno, Nev. Called the 802B, the vehicle has a capacity of 32 cu yd struck, a gross combined weight of 165,000 lb and is powered by a 300-hp turbo-charged Cummins NRT-600 diesel engine. In dumping, the entire trailer raises and the rear trailer wheels move forward to a position directly behind the tractor tires. The fifth wheel is equipped with a ball and socket to provide flexibility in the dumping operation. A special guide and equalizer stabilizes the body in dumping, so there is no strain or twist on the twin, three-stage telescopic hoist. Kenworth Motor Truck Corp., Seattle, Wash.

Here's the only tool you need for all stud fastenings

New Double-Duty

REMINGTON STUD DRIVER

Sets both ¼" and ⅜" studs in steel or concrete—in seconds!

Light-, medium- or heavy-duty fastening, the new Model 455 Remington Stud Driver speeds the job. It sets *two* different size studs... up to 6 studs per minute, either size . . . and offers new possibilities in anchoring conduit clips, steel frames, wood forms and many other fixtures.

Powerful 22 and 32 caliber cartridges drive ¼" and ⅜" studs *solidly* into steel or concrete. For special medium-duty work, the smaller cartridge is used with the larger stud. Result: the greatest flexibility ever in a cartridge-powered tool! Just clip coupon for details.

"If It's Remington—It's Right!"

Remington DUPONT

MAIL THIS COUPON TODAY

Industrial Sales Division
Remington Arms Co., Inc., Bridgeport 2, Conn.

Please send me your free booklet which shows where and how to use the cost-saving Remington Stud Driver fastening method.

*Name*_____ *Position*_____

*Firm*_____

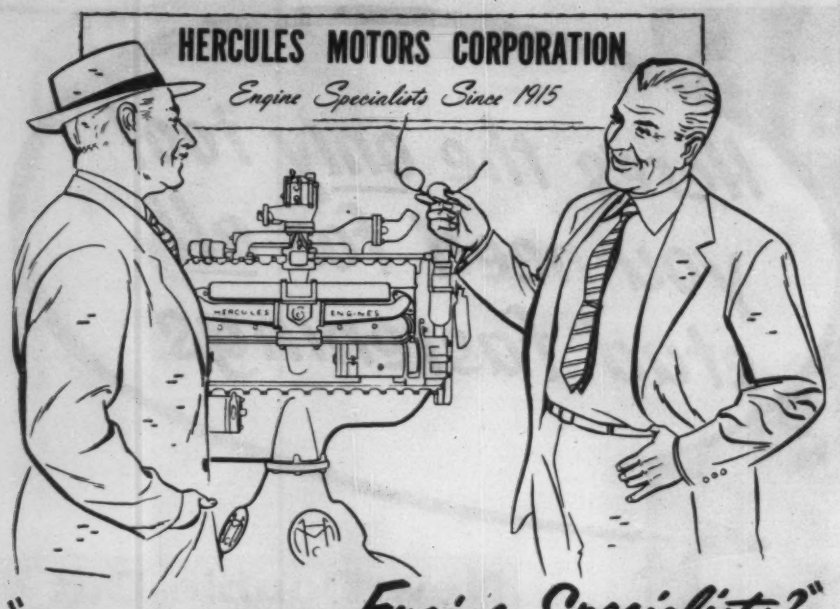
*Address*_____

*City*_____ *State*_____

ENR-11

Only 90 seconds to change barrels

Easy change from one stud size to the other right on the job!



"What do we mean... *Engine Specialists?*"

Briefly, it means that Hercules manufactures engines to meet the customer's requirements. These engines are produced by modern methods and each engine is tailored to fit the equipment which it will power.

The wide selection of engine sizes in the Hercules line, plus the flexibility of our production facilities enable us to specialize in building engines to meet the customers needs. We have over 90 different basic engine models, ranging from 3 to 500 H.P., available for operation on gasoline, diesel fuel, L.P.G., natural gas and kerosene.

Further, it is our policy to work with customers and to help them select the type of engine best suited for their equipment. We do more than merely suggest the use of a standard type engine. Hercules engineers work with the product engineers to select an engine with accessories and other engine components modified or positioned to fit the requirements of the end product. After these engineering problems are solved and the test engine has proved itself, our production of these engines is scheduled to meet your delivery requirements.

Whether your engine requirements are for 1 or 1001, specify Hercules Engines, the product of Engine Specialists Since 1915.

HERCULES ENGINES
HERCULES MOTORS CORPORATION
40 Years of Engines for Industry
129 Eleventh Street, S. E. • Canton, Ohio

ously obtainable and it is equipped with a new nozzle. The nozzle has been designed to provide more efficient gunning of concrete and other cementitious materials. The new rig is constructed so that the entire unit may be hitched to either the air compressor or, if the compressor is mounted on a truck, to the trailer hitch of the truck. AIR PLACEMENT EQUIPMENT CO., 1009 WEST 24TH ST., KANSAS CITY, MO.

New Payloader gets bigger bucket and 40-deg rollback

Another new two-wheel-drive payloader tractor-shovel, model HAH, has been announced.

The new model, which has a struck capacity of ¾ cu yd and a heaped capacity of 1 yd, incorporates all of the features of the smaller HA model which was introduced in February of 1955.

But of particular interest to users is the bucket breakout action which permits 40 deg of tip-back at ground level. The HAH as a breakout force of 4,500 lb, a lifting capacity of 4,000 lb and a carrying capacity of 3,000 lb at 4 mph.

Especially designed for stockpile work, this unit has a short turning radius and rear-wheel power steering for fast maneuverability. Lift is 7 ft 9 in. for easy loading of trucks or elevated hoppers.

Torque-converter-drive and four-speed full-reversing transmission are combined with gas engine developing 57 hp, and travel speeds range from 0 to 14 mph in forward and from 0 to 23 mph in reverse.

The new bucket arm design contributes to operator safety and permits carrying heaped loads at a lower level. The greater stability which results is further improved through the use of a hydraulic accumulator which absorbs load shocks.

The model HAH has front-wheel-hydraulic brakes and a mechanical parking brake which operates off the drive shaft as well. A sealed and pressurized hydraulic system has been incorporated and double-acting rams operate the boom arms and bucket. THE FRANK G. HOUGH CO., 772 SEVENTH ST., LIBERTYVILLE, ILL.

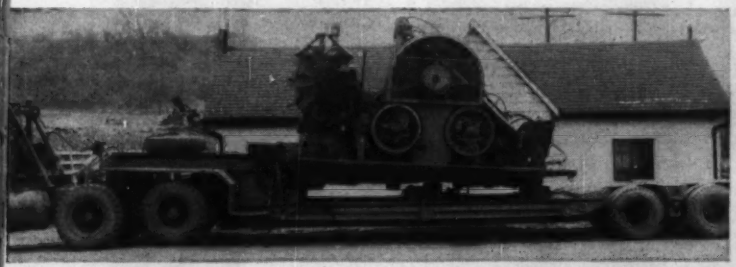
New Iron Powder Electrode Works In Any Position

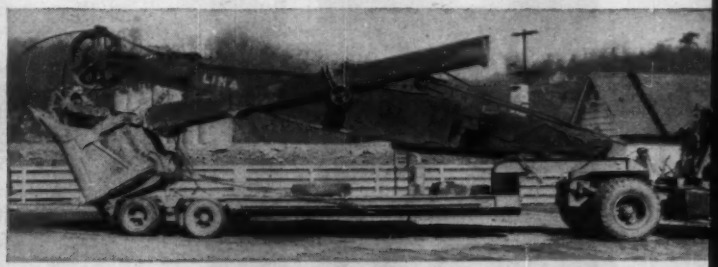
A new all-position, iron powder type electrode called Improved Fleetweld 47 reportedly has the advantages of higher speeds and ease of operation normally associated with iron powder

C. F. Replogle Co. reports:

"4 yd. LIMA 1601 knocked down, trucked 125 miles and reassembled in 3 days"

C. F. Replogle of C. F. Replogle Co., Circleville, Ohio, writes: "We really benefit from the fact that our new 4-yard Lima 1601 shovel knocks down for over-the-road transfer from job to job. We've knocked it down, moved it 125 miles and reassembled it in three days' time. During the eight months we've had it, the 1601 finished shovel work on three jobs and started a fourth.





"The Lima 1601's 400 hp diesel with torque converter 'toys' with a 4-yard rock bucket. It eliminates the necessity to 'clutch' the hoist, and multiplies hoist line pull under load to maintain hoist speed. Cable, gear and shaft breakage due to shock loads are eliminated. The machine consistently loads one E-18 Tournarocker (10 plus pay yards) per minute.

"The new 1601 even digs laminated rock that would usually require drilling and shooting. And its rugged construction cuts maintenance costs. To date, our 1601 has loaded out over 800,000 yards of rock without a single mechanical failure. We got all this for an original capital investment considerably less than we'd spend for other like capacity machines."

You can get all these benefits with the new Lima Type 1601! Send today for our new booklet containing detailed specifications. Write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio . . . or see your nearby Lima distributor.

BALDWIN · BLH · LIMA-HAMILTON

LIMA SHOVELS · CRANES · DRAGLINES · PULLSHOVELS

BALDWIN-LIMA-HAMILTON

Construction Equipment Division · LIMA · OHIO · U. S. A.

DISTRIBUTORS IN PRINCIPAL CITIES OF THE WORLD

FOR MORE DETAILED INFORMATION WRITE FOR BULLETIN W-2A and W-10.

GOLDEN ANDERSON Valve Specialty Company

1208 RIDGE AVE., PITTSBURGH 33, PA.
Designers and Manufacturers of VALVES FOR AUTOMATION

G-A ELECTRIC CHECK VALVE

G-A SURGE RELIEF VALVE

SHOCK TAMER TWINS

SURGE

These two automatic cushioned valves will prevent the hammer and shock normally caused by surges in the system.

electrodes used only in downhand operation. The new iron powder electrode is for applications where an all-round, universal type electrode is needed for welding in any position, and it is claimed to surpass the performance of conventional electrodes and to give previously unobtainable iron powder results in out-of-position welds.

The electrode can be used for welding of mild steel on either AC or DC current. Powdered iron is included in the coating to produce higher deposition rates which result in 10 to 30% higher welding speeds than those obtained with conventional electrodes. Further up to 30% more length of weld per electrode is claimed, meaning fewer electrode changes and higher operating factors.

Improved Fleetwood 47 is said to have all operating characteristics associated with iron powder type electrodes. Bead appearance is reportedly smooth and clean with minimum spatter; slag is practically self-cleaning. According to the manufacturer, the arc is smooth, soft and stable in all positions and has no tendency to stick on either AC or DC, and it can be operated with either a drag or short arc technique. It is claimed to be especially efficient in overhead welding and in poor fit-up situations.

The electrode conforms to AWS class E-6013 and is available in sizes from $\frac{1}{8}$ inch to $\frac{5}{16}$ inch diameters. The Lincoln Electric Co., Cleveland 17, Ohio.

Rifle Sights, Easy Focusing Get Transit Target Fast

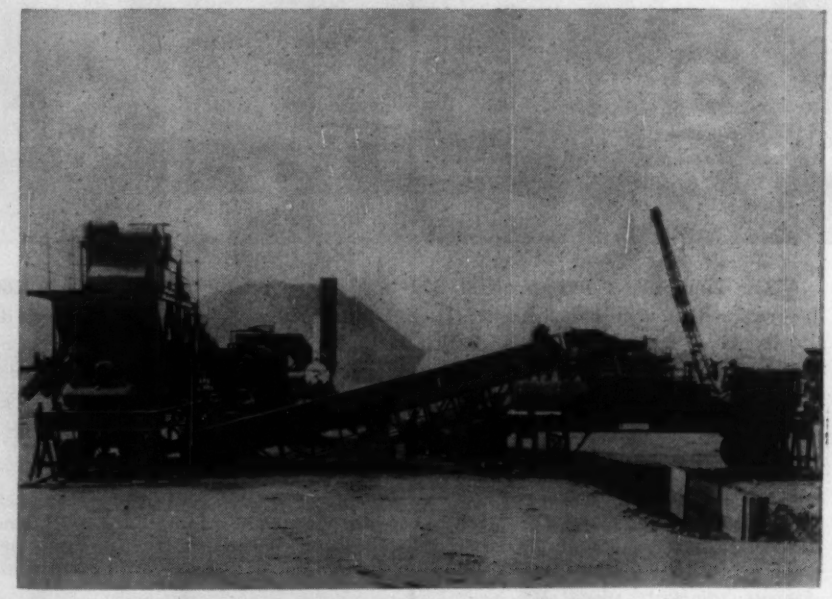
A new 5$\frac{3}{4}$-in. survey transit has rifle sights to bring the telescope on the target immediately. Further, a focusing knob through telescope axis is said to permit easy setting regardless of telescope position.

Though inexpensive, this instrument is reported to be thoroughly dependable and accurate even when subjected to rugged use. Umeco Optical Div., 465 California St., San Francisco 4, Calif.

Frameless Dump Trailer Can Provide Bigger Payloads

When dumping a load, the entire front end of the Teleramic frameless dump trailer is lifted by a single hydraulic telescope cylinder mounted on the tractor fifth wheel coupling. In raising or lowering, the trailer body pivots

(*Continued on page 84*)



Mobile Plant Needs No Erecting Crane

The H & B Mobile 40 is a portable batch type asphalt plant with a capacity range of 100 to 120 tons per hour that has been designed for ease of erection, portability and flexible set-up arrangement. All units are wheel mounted, and no crane is needed for erection. All piping and wiring are permanently installed, with quick disconnects. The Mobile 40 meets all state specifications. There are no shafts, chains or gears. All remotely located units are driven with electric motors. The complete plant—tanks, oil heater, power units, piping, etc.—is available from one source. Hetherington & Berner, Inc., 701 Kentucky Ave., Indianapolis 7, Ind.

RADIO helps build roads, level rough country, fight fires in the California mountains

Archibald's two-way radio-equipped supervisory vehicles, and special units such as the roving greasing truck (above), coordinate as many as 12 widely separated projects with the San Carlos head office. Radio keeps all units under constant supervision, saves time, money.

J. O. Archibald Co., San Carlos General Engineering Contractor Uses G-E 2-Way Radio . . . Keeps Equipment Working A Dozen Jobs At One Time.

ORDERS from the head office of the J. O. Archibald Company are dispatched to supervisors on the job by two-way radio. Company operations, sometimes widely separated, cover the San Francisco peninsula area and surrounding mountain districts. Yet all projects are under radio direction—through two-way radio equipped supervisory vehicles.

Archibald operates under private and government contracts for road building, pipeline installation, and earth moving projects of all kinds. When needed, company equipment helps fight fires threatening vital lumber lands.

"Radio Has Paid For Itself Many Times . . ."

"Our G-E radio has paid for itself many times over", say Archibald officials. "It saves us time, is convenient, speeds parts and men to projects, permits prompt response to emergency calls." The company reports excellent coverage with low band equipment—a 60 mile average from base to car, at times up to 60 miles car to car. A remote relay transmitter atop a mountain four miles from the base station helps overcome terrain interference.

Progress Line Offers New Advantages

The new G-E Progress Line of two way radio saves money on maintenance through faster servicing, protects from obsolescence because chassis are interchangeable. Changes in frequency, power, type of reception are made quickly at a minimum cost. See your local G-E Communications Counselor for full details. Or, write to: *General Electric Company, Communication Equipment, Section X22115-24, Electronics Park, Syracuse, New York.*

2-WAY MOBILE RADIO

Progress Is Our Most Important Product

GENERAL ELECTRIC

4300 tons of Bethlehem Steel Sheet-Piling were used in building the two cofferdams at Long Sault. The larger of the two contains cells filled with sand and gravel, about 48 ft in diameter and 42 ft high. The smaller contains eight 60 ft cells, 56 ft high. One half of the dam will be constructed on this site.

Steel cofferdams completed at two locations for St. Lawrence power project

The Long Sault dam will be constructed one-half at a time. The dewatered area enclosed by the cofferdams is to the south or American side of the river. To complete the dam similar temporary cofferdams must be built to span the river (to the right in the photograph).

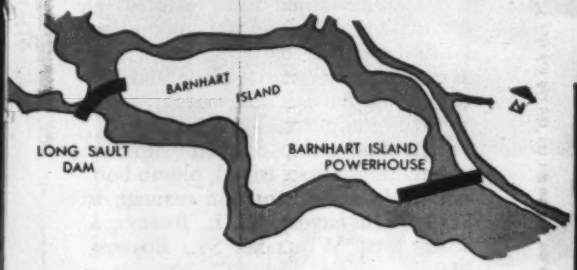
Construction of huge temporary sheet-piling cofferdams at two locations in the International Rapids section of the St. Lawrence River has now been completed. The two cofferdams, one at the site of the projected Long Sault Dam, the other at the Barnhart Island power houses (see map), mark the beginning of major construction on the two-nation St. Lawrence Seaway Power Project.

Development of the hydroelectric power potential of the St. Lawrence is estimated to cost $600 million. The bulk of the work will be in the International Rapids section where the river's flow is 237,000 cu ft per second, as compared to approximately 200,000 cu ft per second of the Niagara River. The project is an integral part of the St. Lawrence Seaway development program which will also open the heart of the continent to 75 per cent of the world's merchant shipping fleet.

More than 16,000 tons of steel sheet-piling have been used in building the cofferdams at Long Sault Dam and Barnhart Island.

At Long Sault, where the dam will be built one-half at a time, the Dravo Corporation has completed diverting the river, constructing two cofferdams of cells and connecting arcs filled with sand and

60 temporary cells with connecting arcs extend for nearly one mile across the river at the Barnhart Island site. The river behind the Barnhart Island power houses will form a pool which will flood about 16 square miles of Canadian farmland and several small communities which must be relocated.



gravel, and dewatering the area. One-half of the dam will be constructed on this area, and then a similar process will be followed to span the river and complete the dam. Over 4000 tons of Bethlehem Sheet-Piling were used in building the two cofferdams.

At Barnhart Island, the Mannix-Raymond Company of Canada has constructed a mile-long cellular cofferdam which spans the river and on this site the twin power houses will be built. Work at both sites was greatly simplified because of studies made on a $200,000 scale model of this section of the river, which accurately duplicated shore lines, bottom contours, the turbulence and flow of the river.

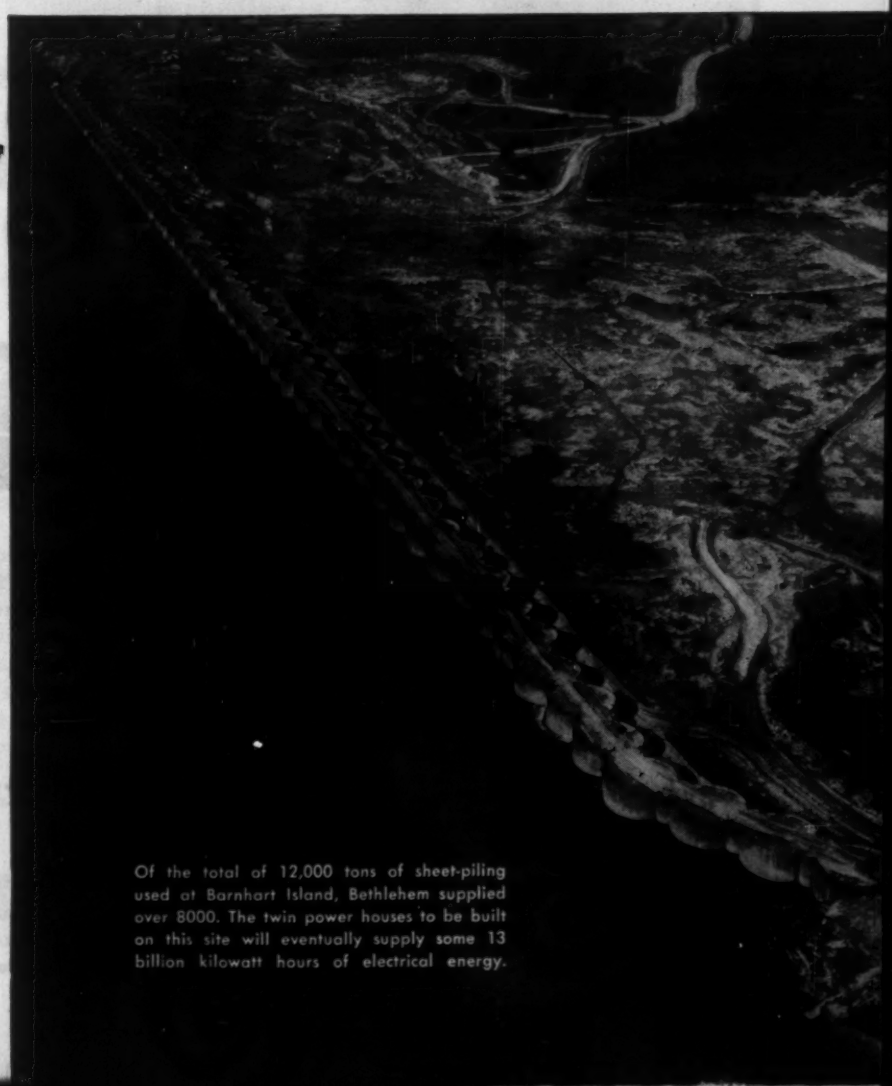
At Barnhart Island some 12,000 tons of sheet-piling were used, more than 8000 tons of which were supplied by Bethlehem.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

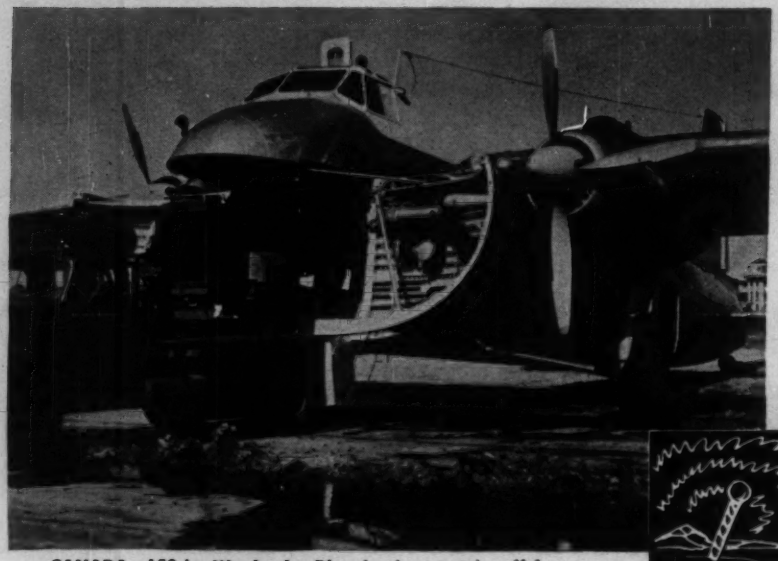
BETHLEHEM STEEL



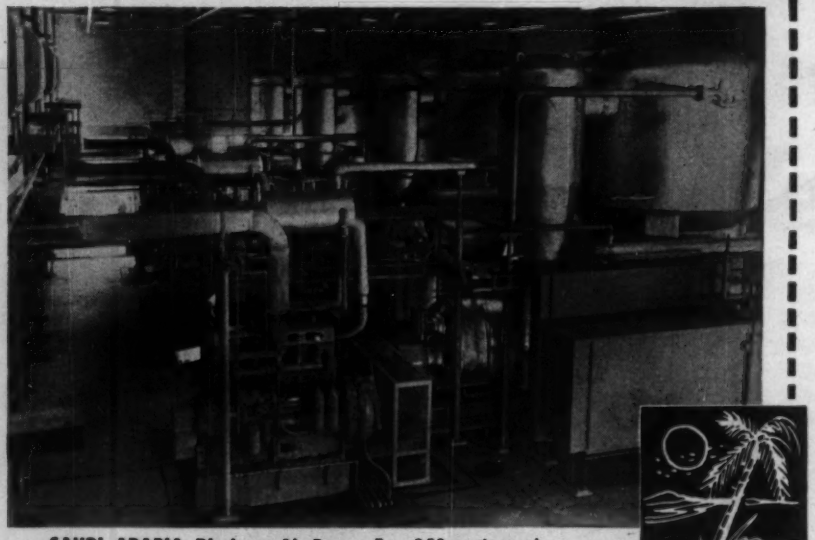
Of the total of 12,000 tons of sheet-piling used at Barnhart Island, Bethlehem supplied over 8000. The twin power houses to be built on this site will eventually supply some 13 billion kilowatt hours of electrical energy.

from the Canadian Arctic----

to Saudi Arabia----------



CANADA—150 hp **Waukesha Diesels** about to take off for service in the far north.



SAUDI ARABIA, Dhahran Air Base—Four 250 continuous hp **Waukesha Diesels** power Cleaver-Brooks distillation units producing 200,000 gal. of potable water daily.

● Power packed, fast and smooth—with built-in stamina and reliability for every industrial service, in any country or climate —Waukesha Normal or Turbocharged Diesels, Gas, or Gasoline Engines—up to 1135 hp. Waukesha Motor Company, Waukesha, Wis., New York, Tulsa, Los Angeles. Get Bulletin 1079.

WAUKESHA *Diesels*

290

NEW PRODUCTS

around the rear wheels, and during this cycle, tubular stabilizer arms, pinned to the hoist-fifth wheel and the trailer body, give added support.

The advantage of this new dump trailer design is that additional legal payloads up to 2,000 lb can be hauled. The elimination of the conventional trailer frame and the use of only one front mounted head lift telescopic cylinder makes this weight saving possible. The frameless dump trailer is literally a dump body on wheels. Hoist location over tractor driving wheels reportedly gives excellent traction for spreading. ANTHONY CO., STREATOR, ILL.

22-Power Transit-Level Focuses Down to Three Feet

A redesigned optical system with a 3-ft short focus for close-quarters surveying is a feature of a new builders' convertible transit-level.

An internal-focusing 10¼-in. telescope with 22-power coated optics views object right side up, and accurate leveling is said to be assured by providing a plate level vial in addition to the sensitive telescope vial. The forged brass horizontal circle and the vertical arc have double verniers reading to five minutes.

The retail price, complete with mahogany transit case, tripod, plumb bob, sun shade and instruction manual, is $219, FOB factory. C. L. BERGER & SONS, INC., WILLIAMS ST., BOSTON, MASS.

Broken-Line Stencil Speeds Dot-Dash Drawing

A new instrument for architects, engineers and draftsmen provides a fast way of drawing accurate broken lines.

The template is made of transparent plastic, and is 12 in. long, 2¾ in. wide, and although it is only 0.0075 inches thick, it reportedly cannot be torn or broken.

This template provides six different broken-line patterns or stencils—long dash, short dash, long dash and dot, short dash and dot, long dash and two dots, and short dash and two dots.

The directions for use are simple. A tee-square or other straight-edge is placed on the desired stencil, and a line is drawn against the straight edge. Density of lines will be determined by the hardness of the pencil used.

Cost is $1.25 each, plus 10 cents postage per package of one or more. DOT-N-DASH, P. O. Box 668, CRESSKILL, N. J.

$750 SAVED IN ONE SEASON

using Torque converter on power shovel

A prominent contractor recently reported that he saved $750 in one season using a Twin Disc *Three-Stage* Torque Converter on one of his power shovels.

This total was comprised of savings on three different phases of the shovel's application. (1) Cable—on two shovels with direct drive, cables were replaced *seven times* on one and *eight times* on the other. With torque converter drive, however, the cable was replaced *only three times*. Resultant saving: $350. (2) Maintenance costs — a saving of 12½ cents per hour, or a season total of $250 on the shovel with the Twin Disc Converter. (3) Fuel consumption — the torque converter unit used ½ gallon less fuel per hour, saving $140 in the 2,000 hour season.

You can realize a *similar* saving from *your* power shovels. *Specify* Twin Disc Torque Converters for your new units or *install* them in your existing equipment. For full details see your equipment or engine distributor. Write for bulletin 135-D.

All facts in the above story are contained in an actual case history. We have not identified the operation because publishing the owner's name would reveal confidential information.

Here are *five* money saving advantages that torque converter drive provides *your* particular power shovel application.

CABLE PULL — Torque converter automatically adjusts for wide variations in dipper loading, substituting greater digging effort for speed when required.

ENGINE OUTPUT HORSEPOWER — Torque converter allows engine to produce near maximum hp when load requires it. High engine power always available for hoisting and crowding.

ENGINE SPEED — Torque converter provides high engine speed throughout its working range, and higher hp output is available for heavy digging and hoisting loads. Converter equipped engine can't lug. Heavy overloads will not kill the engine.

LOWER MAINTENANCE COST—Torque converter reduces peak loads throughout shovel drive train. Cushioning shocks increases wear life for most parts subject to fatigue failure.

LONGER CABLE LIFE — In proved installations, even frayed cables with short life expectancy have been known to last a year or more where a torque converter has provided smooth, sustained output power.

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TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

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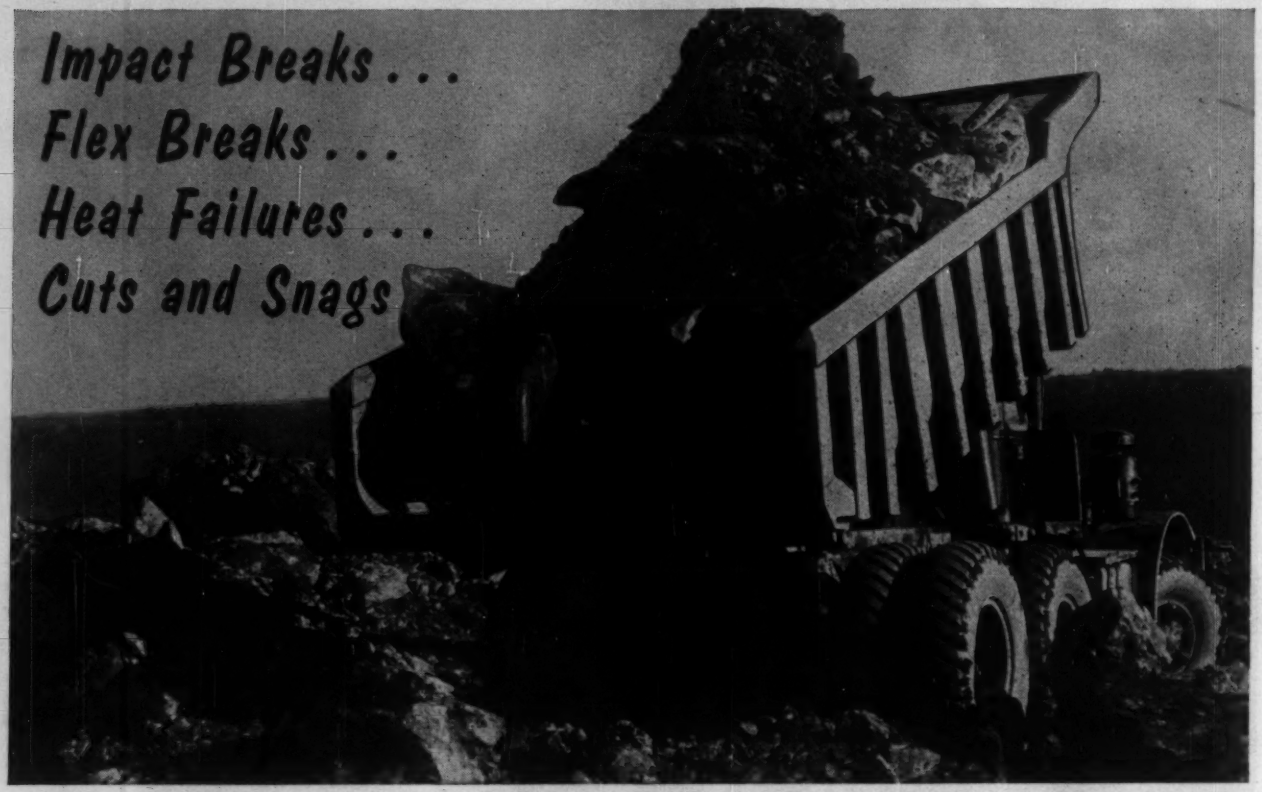

with Firestone Nylon Tires

FIRESTONE Nylon Off-The-Highway Truck Tires are built to deliver more hours of service on the toughest rock work, earth moving or strip mining job.

The Firestone Safety-Tensioned Gum-Dipped* nylon cord body with four extra tread plies absorbs toughest impact shocks. It gives the greatest protection against flex breaks, heat failures and damage due to cuts and snags.

You keep your downtime at a minimum with Firestone Nylon Tires. The treads give maximum traction and they are extra tough to resist cutting. The sidewalls are double thick to give added protection against costly sidewall injury.

Let your Firestone Dealer or Store show you how Firestone Nylon Tires can cut your tire costs.

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When you buy new equipment or replacement tires, specify FIRESTONE

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

Copyright 1955, The Firestone Tire & Rubber Co.

Spare Parts Solve Compaction Problem

How do you keep a 4-in. thick sand and gravel filter course stable under the loads imposed by the placement of 19 to 24-in. concrete slabs? This was the problem facing the Hallet Const. Co. of Crosby, Minn., when it installed approximately 80,000 yd of concrete apron around the maintenance hangars at Offutt AFB near Omaha.

Several compaction methods were tried on the filter course including steel wheeled rollers, pneumatic tired compactors and tracking with a

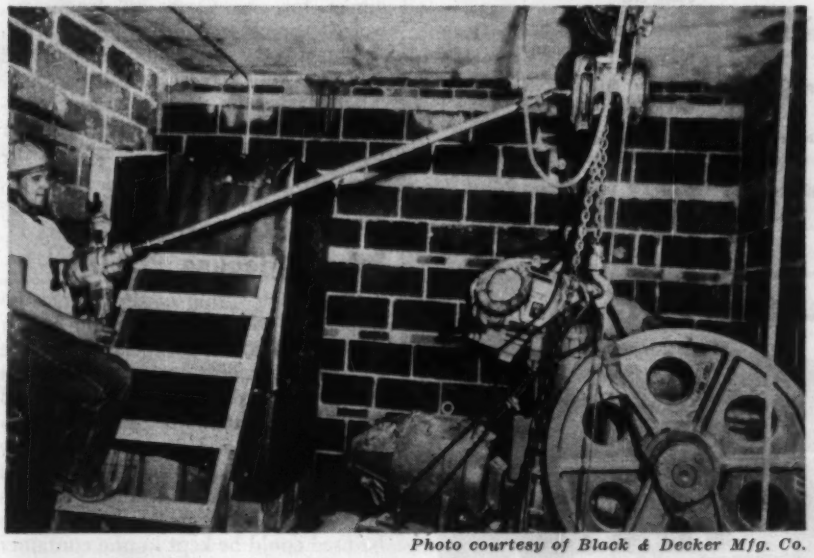


Photo courtesy of Black & Decker Mfg. Co.

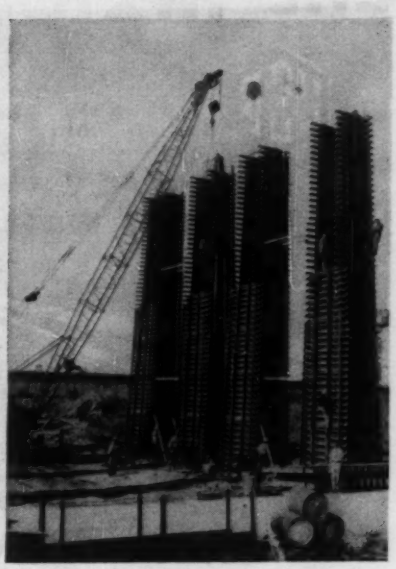
Electric Drill Lifts Heavy Loads

Raising heavy equipment into position where space is cramped is a problem that has been licked by a Baltimore firm that uses a ¾-in. electric drill to accomplish the job.

The General Elevator Company is engaged in the manufacture and installation of elevators in multi-storied buildings throughout the East. Locating the heavy elevator hoisting equipment in position at the top of a building presents some serious problems.

General Elevator engineers obtained a heavy-duty drill with a speed of 275 rpm. Its chuck was attached to a 6-ft pipe extension, and the opposite end of the pipe was coupled by a universal joint to a chain fall located at the top of the elevator shaft. The drill is equipped with a reversing switch which makes it a simple matter to swing or lower the equipment into position.

One man, using this rig, can lift heavy loads—up to 8,000 lb—into place.



99 ft. Continuous Pour Using Richmond Tyscrus Believed Record

M-C&S designs forms for pour without interruption

What is thought to be the highest continuous pour in the area was made by Merritt-Chapman & Scott on its pier construction for the Newark Bay Bridge. For each of the 41 piers on the Newark side of the bay, and the 16 piers on the Bayonne side, forms were designed for a 10′ liquid head and were set to the full height of the pour. Richmond Tyscrus were used throughout; 123 1″ 4-strut Richmond Tyscrus holding the highest placement – 99′ 9⅜″. Concrete was poured to the maximum design strength of tie rods and forms, and every column went up without incident.

For speeding all types of concrete form work, the extra safety margin of Richmond Tyscrus counts heavily. The actual load strength of Richmond Tys far exceeds their published load. For instance, severe performance tests conducted by Brooklyn Polytechnic Institute show that 1″ 4-strut Richmond Tyscrus (published safe load strength 24,000 lbs.)—identical with those used on the Newark Bay Bridge—actually test out at 38,000 lbs.

Hangers, Screed Chairs, Lagstuds and all Richmond equipment are made with the same professional attention to the contractor's needs as are Richmond Tyscrus. Write for the 1955 Richmond Catalogue which details Richmond products and their many uses. It can save *you* time and money on your next job. Address:—RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Avenue, Brooklyn 8, N. Y., or 315 South 4th Street, St. Joseph, Mo.

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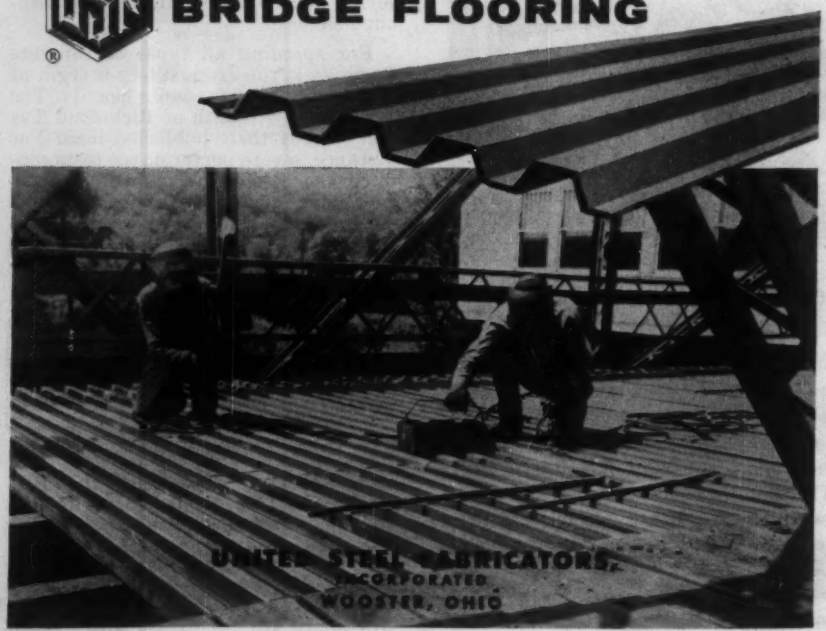


crawler tractor. None were satisfactory.

• **The answer** was found in the right combination of steel plates and the impulse motors taken from a shoe-type backfill compactor. A ¼-in. steel plate —2 x 12½ ft—was formed with an upturned leading edge so that it would slide over the sand. Steel webbing comprised of short steel plates and bars were then added for stiffening and two vibrator motors were attached. Total investment for one vibrating plate amounted to $2,500.

Pavement courses are 24 ft wide, so two plates are used. However, they can be used for narrower courses simply by increasing the amount of overlap. In operation, the filter course is first gone over by a subgrade planer. After this first pass the sand and gravel is wet down and another pass is made with the planer. This time, however, the vibrating plates are dragged behind. One pass with the plates stabilizes the filter course so a man can walk on it with ease.

Hallett superintendent and vice president, Wilford Apsholm; job superintendent, Robert McConnell, and Capt. John McElhenny, area engineer for the Corps of Engineers, were responsible for the new device.

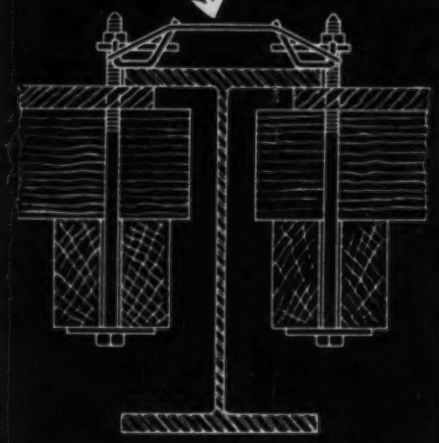
This was the second job-made device turned out by Hallett on this contract. The first was an economy-model paving breaker consisting of a pile driver head mounted on an old truck chassis (ENR June 2, p. 25).

Trucks Without Wheels Solve a Hauling Problem

To reduce silting of the Maracaibo ship canal which connects the harbor of Maracaibo, Venezuela with the Caribbean, it was decided to build a 2¼-mi long breakwater. But how to move the tremendous amount of material required and do it economically was a problem. Both land and sea transport was involved and it was decided that if the rock which was to be used could be kept in one container or body over the entire trip, the project might become feasible.

The answer was a special steel scoop-end truck body equipped with hooks for crane handling. Developed by Gar Wood, the trucks without wheels were set on flat bed trailers at the quarry and hauled to the shore. From here they were placed on barges and hauled to an island which serves as an anchor point for the breakwater. On reaching the island they were again crane lifted and placed on railroad flat cars for shipping to the dumping site.

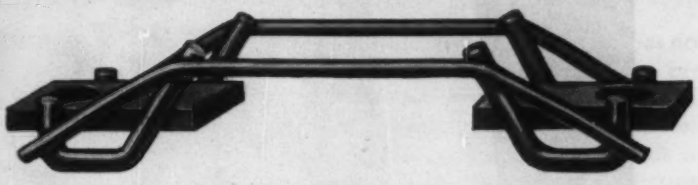
Faster Adjustment from TOP of Deck



TOTAL SAFE LOAD ON BOTH COIL BOLTS IS 10,000 LBS., OR 5,000 LBS. PER BOLT

..WHEN HANGING FORMS WITH

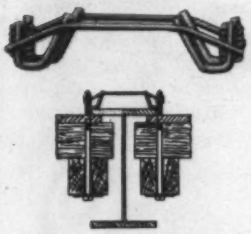
SUPERIOR PLATE HANGER FRAMES



With Superior Plate Hanger Frames the installation and necessary adjustment to bring the deck forms tight against the flange are from *above* the deck. Coil Bolts are passed through and secured from above with coil nuts. Bolts are easily removed without binding because, (1) nuts are square and will not turn; (2) embedment of the bolts in the concrete is at a minimum since the plate is only ½" above the flange.

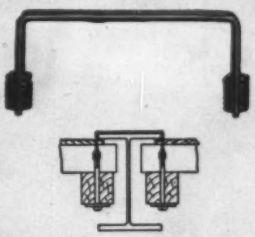
FOUR OTHER SUPERIOR WAYS TO HANG FORMS FROM STEEL BEAMS AND GIRDERS ON BRIDGE SUPERSTRUCTURES

STANDARD COIL HANGER FRAME



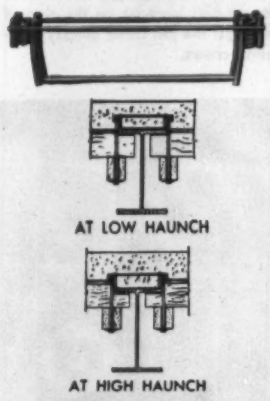
When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior *Standard* Hanger Frames. Detail at left shows their use with double ledgers, ½" coil bolts, and flat washers. Total safe load on both bolts for Type 10M is 10,000 lbs., or 5,000 lbs. per bolt. For Type 6M, total safe load on both bolts is 6,000 lbs., or 3,000 lbs. per bolt.

COIL BEAM SADDLE



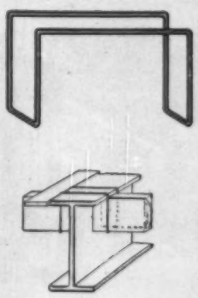
On jobs where hanger wires may be cut after stripping the forms, use Superior Coil Beam Saddles. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each ½" Coil Bolt. Coil Beam Saddles are also furnished for ¾" and 1" bolts.

SPECIAL HANGER FRAME



The design of certain bridge superstructures allows for the permanent deflection of the beams or girders due to the pre-calculated dead load. This deflection is compensated by a concrete haunch of varying depth on the upper flange. Superior *Special* Coil Hanger Frames were developed to meet this field condition, at the same time avoiding any exposed hanger wire. The extent to which the ½" coil Bolts are threaded into the coils allows for these varying haunch depths from maximum to zero. (See detail). Total safe load per frame is 10,000 lbs., or 5,000 lbs. per ½" bolt.

WIRE BEAM SADDLE



Wire Beam Saddles are used to hang centering joists from structural steel beams when the beams are not fireproofed with concrete. On non-fireproofed structures the load is determined by the allowable spacing of centering joists rather than the capacity of the hanger. Available in three gauges and sizes as required. Will carry safely, total loads of 2,500 lbs. to 6,000 lbs. Layouts and estimates will be sent upon receipt of plans or quantities. No obligation.

WORKING PARTS (Bolts and washers) are returnable. Layouts and estimates for Superior Hangers are available without obligation.

SUPERIOR CONCRETE ACCESSORIES, INC.

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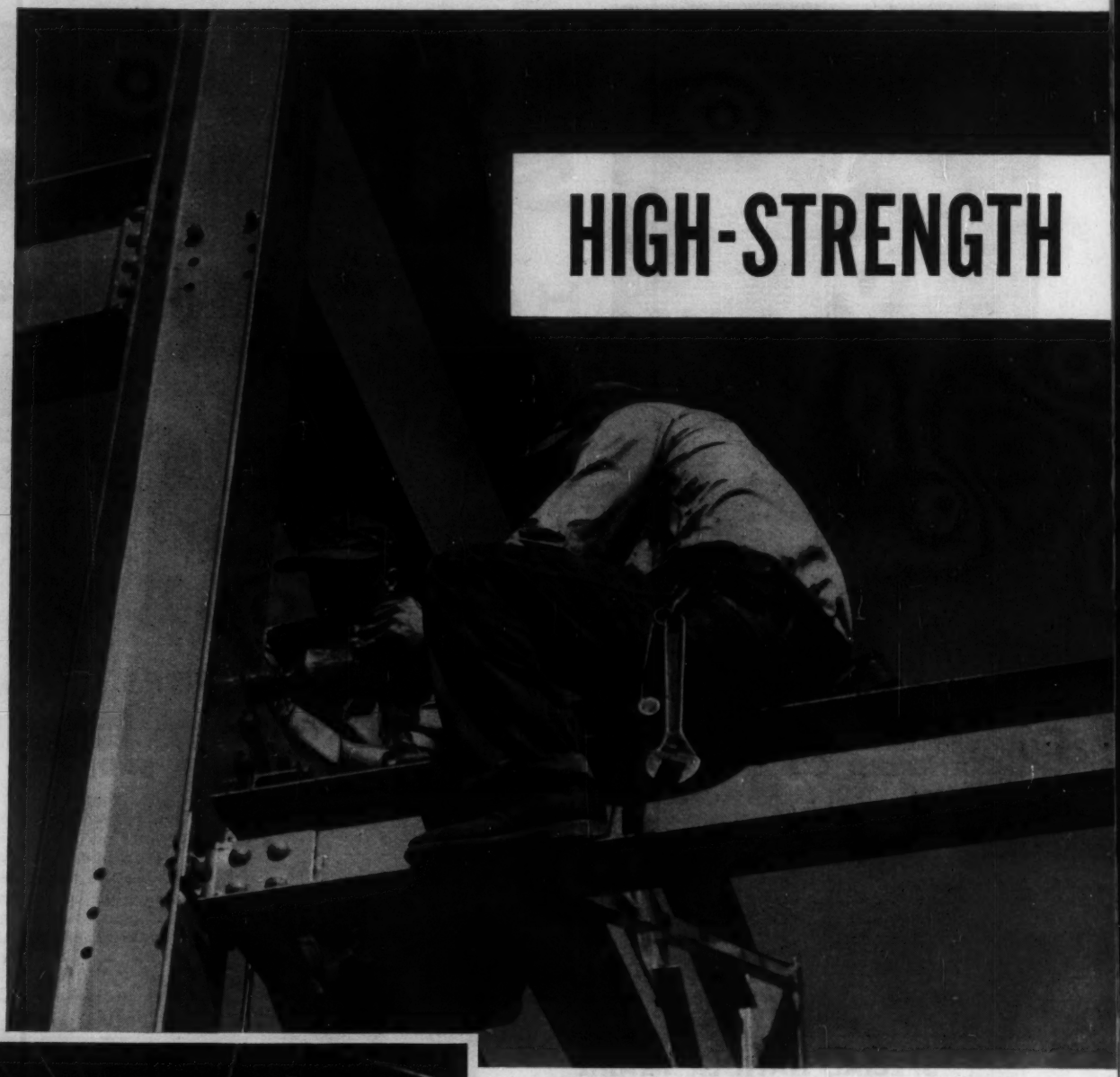
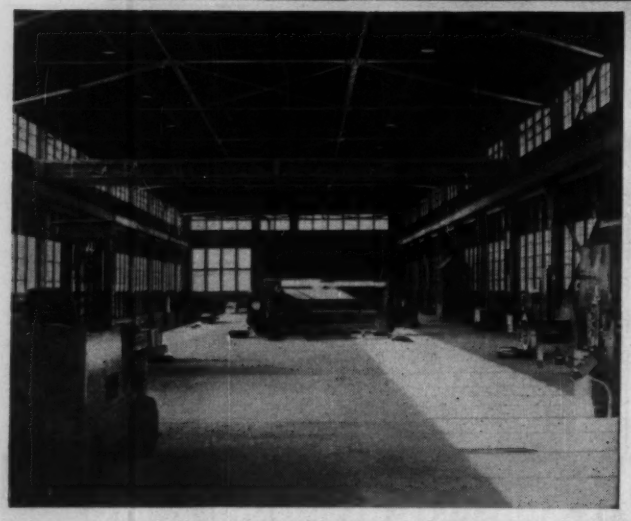
HIGH-STRENGTH



TWO-MAN OPERATION SAVES TIME no matter what size job is involved. In fact, installed savings per high-strength bolt increase as the size of the structure decreases . . . because bolts get the job done quickly without the need for big, specialized riveting crews.



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Haven-Busch Company cost data shows:

BOLTING CUTS FASTENING TIME 75%

Recently, the Haven-Busch Company of Grand Rapids, Michigan, completed the steel work on a medium-sized manufacturing plant being erected at Midland, Michigan. Careful time and cost records were kept throughout construction, particularly regarding the use of Republic High-Strength Structural Bolts.

The resulting data shows, ". . . the time for bolting-up using High-Tensile Bolts was reduced by almost three-fourths, as opposed to rivets. This reflected a very substantial cost saving in field labor, which more than offsets the additional cost of the High-Tensile Bolts as opposed to the cost of the rivet material."

Beyond time and cost savings, important enough in themselves, other major advantages are yours when you use Republic High-Strength Bolts. These include:

GREATER JOINT STRENGTH—Since these bolts are not only stronger than comparable rivets but provide a vise-like grip as well, loads may be transmitted by friction between the structural members . . . relieving the bolt of shear stress. This same powerful clamping action improves fatigue life under dynamic loading to a point where it no longer need be a design consideration.

INCREASED SAFETY—Unlike riveting, bolting does not require a lot of expensive scaffolding. Crews can work in comparative safety from within the structure. Add to this the elimination of a vast amount of equipment and the fire and accident hazards of hot rivets, and you have the safest construction method yet developed.

REDUCED NOISE LEVELS—When you bolt, your building is a better neighbor right from the start, particularly near hospitals, schools and in commercial areas. Ear-shattering rivet guns are replaced with pneumatic impact wrenches making a small fraction of the noise for far less time.

Finally, bolted construction affords both easier inspection and complete salvageability of structurals. This is of immense value where all or part of a structure must be dismantled and rearranged from time to time to meet changing production requirements. No footage is lost through torch cutting of riveted joints.

You can start right now taking advantage of the speed, safety and economy of steel erection using Republic High-Strength Bolts. Simply contact your local Republic representative or mail the coupon for further information.

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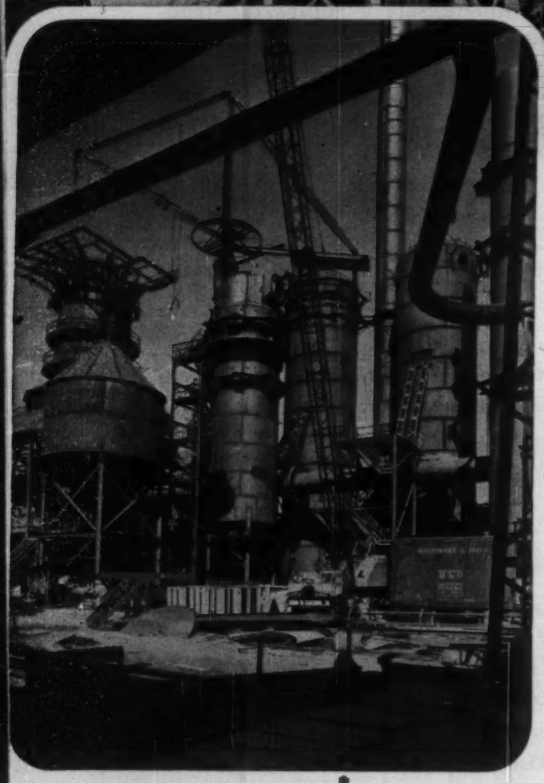

Completed project (top) and construction view of blast furnace shell, hot blast stoves, stack, dust catcher, and inter-connecting ducting and walkways. Built for Pittsburgh Coke and Chemical Company, Neville Island, Pittsburgh, Pa.

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THE SPRAY TRUCK is designed for flexibility in application of the silicone solution. Here one operator with a hand spray treats the facia concrete while part of the deck and the safety walk is covered by the main spray bar.

Concrete Bridges on N. Y. Thruway Protected by Sprayed-on Silicone

Many concrete bridges on the New York State Thruway have been treated with a silicone solution to minimize if not entirely eliminate the effect of freeze-thaw cycles during winter months. This form of treatment has been adopted by the New York State Thruway Authority because it has found that the silicone, by reversing the capillary attraction of concrete for water, reduces the moisture absorption of the concrete more effectively than any other practical surface treatment now in use.

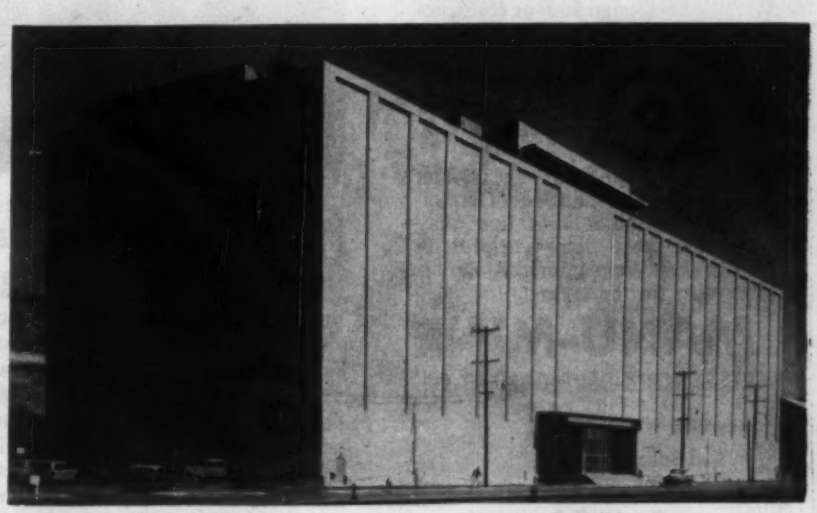
Special attention is being given to the bridge decks, but the silicone treatment also is being applied to safety walks, center malls, facia and end pylons because of the small added cost. Bridge decks, due to the fact that they are relatively thin and are exposed on both sides, are much more subject to freezing-thawing cycles than are the adjoining concrete pavements. They freeze sooner, de-icing salts "thaw" the surface, but additional snow or sleet may dilute the solution to the point where it refreezes, making frequent salt application necessary. The possibility of scaling, therefore, is greatly increased.

Current specifications of New York State call for air-entrained concrete for bridge decks. However, before these specifications went into effect, about 500 bridges had been built to specifications calling for a blend of natural and portland cements. Of these, the 160 that are maintained in their entirety by the Thruway Authority are being given the silicone treatment. Ultimately, this treatment will be given to bridge decks built with air-entrained concrete, including the three-mile-long Tappan Zee Bridge.

On the new bridges, the silicone treatment will replace the oil-spray treatment on which New York State pioneered several years ago. This is being done because it has been found that where the silicone treatment was applied to bridges that had received the oil treatment, the water repellency of the surface was greatly increased.

The reasons for this increased effectiveness appear to be threefold. Silicone itself is more hydrophobic by nature, being second in this respect only to paraffin. It rapidly dries out on application without exhibiting any tendency to attract a film of air-borne dust and dirt. Third, its resistance to oxidation indicates that it retains its original ability to repel water far longer than even the best organic oils.

Just exactly how long it will remain effective is impossible to say at this time. It is known that similar silicone treatment for brick and masonry buildings is still performing well after more than ten years of service. There also is evidence that the silicone combines chemically with the silicates in masonry to form a bond that endures for the life of the masonry surface itself.

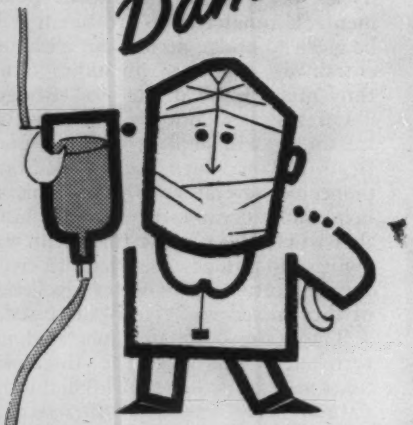


Radiation Protection Is Goal of New Lab

In this windowless 6-story reinforced concrete building researchers will probe into the effects of nuclear radiation. Here, new methods to prevent or minimize the hazard will be developed. The $8 million building will be headquarters for the U. S. Naval Radiological Defense Laboratory whose notable past achievements include the development of a washroom system to protect ships from radioactive fallout.

REJUVENATION

for Reservoirs and Dams!



Both friend and enemy of mankind, water can be a mighty destructive force in spite of a serene and placid appearance. Pressure can force underwater leaks and weakening of loose subsoil with consequent loss of precious water and permanent damage to foundations.

Municipalities and industries today more than ever before are calling in Manu-Mine geological engineers and technicians:—

(1) To repair damage to existing installations through newly developed scientific application of soil solidification* and —

(2) Design and/or construction of reservoirs, dams, retaining walls, etc., which will withstand the combined forces of water and weather for years to come.

*Our 16-page booklet entitled "The Science of Soil Solidification" may prove particularly helpful in your future planning. A copy is yours for the asking.

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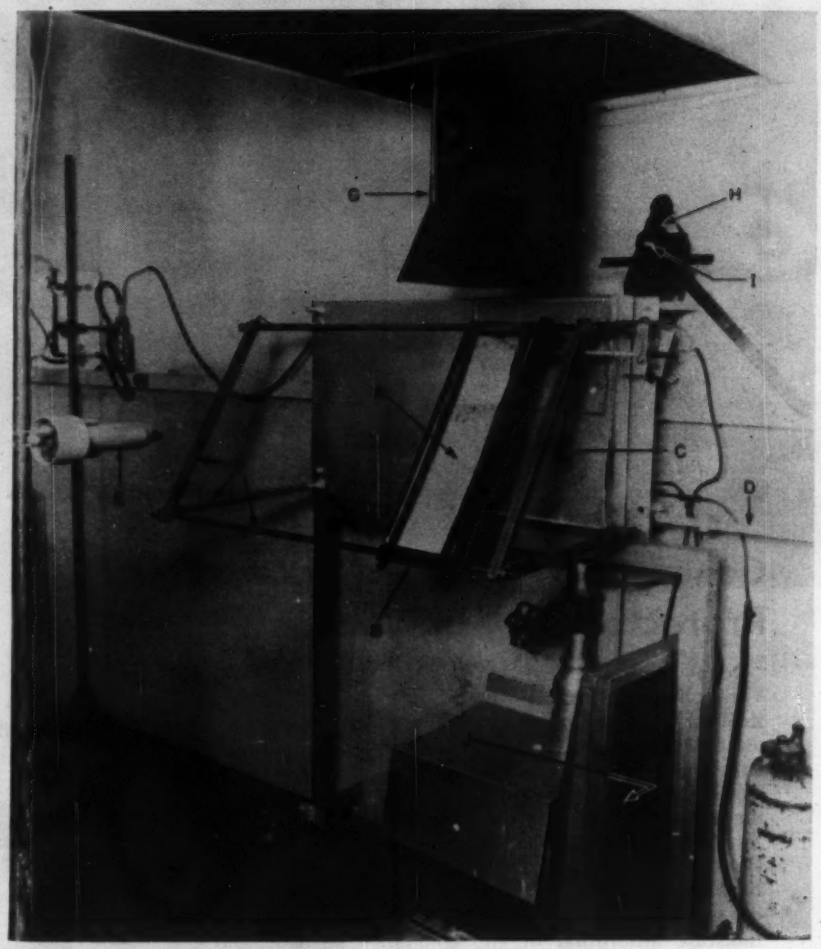
On the other hand, surface wear is much more pronounced on pavement than on buildings, hence an exact comparison as to behavior cannot be made.

Further, it should be noted that the silicone product used on the thruway bridges is not identical with that used to waterproof masonry. The masonry product is a straight silicone resin dispersed in solvent, while that used on the thruway bridges is a sodium methyl siliconate, or a sodium salt of silicone, diluted in water. Commercially, it is Dow Corning XS-2a.

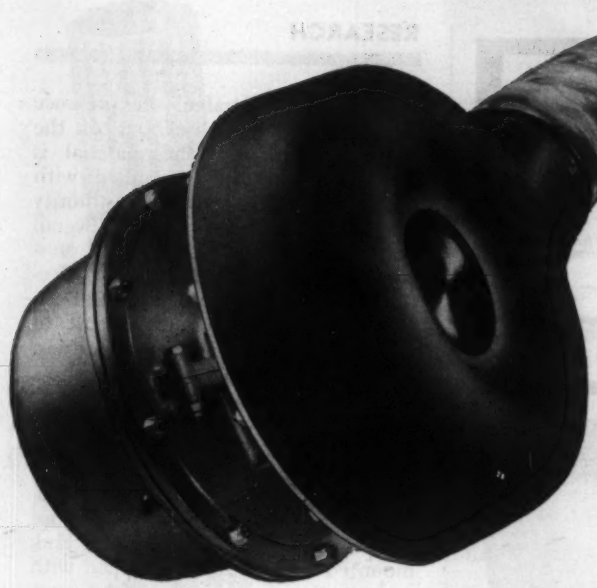
Water-dilution was a primary factor in selecting the material. Inasmuch as it was to be applied to many bridges



How Fast Does Fire Spread?

There is now a method for measuring the rate at which flames spread along the surfaces of many materials. While standard test procedures have been in use for many years for evaluating the fire resistance of many types of building materials, methods for evaluating the rate at which a fire will spread are not so well standardized.

The apparatus developed for these measurements—a brainchild of the fire protection section of the National Bureau of Standards—consists of a radiant panel, a frame for supporting the test specimen, and the associated measuring equipment. In a test, specimen (A) is inserted in the supporting frame (B). The radiant panel (C) made of a refractory material is heated by a homogeneous gas-air mixture supplied from the rear (D) and burned in contact with the refractory material. The panel's energy output is measured by a radiation pyrometer (E) before the loaded specimen is slid along the rack (F) and positioned in front of the panel. Hot products of combustion and smoke are carried away by the stack (G) above the specimen and panel. Thermocouples within the stack record the temperatures there. A smoke sampler (H) incorporating a filter (I) is inserted into the open top of the stack just before starting the test. The air filter (J) in the air supply keeps dust from the radiant panel.



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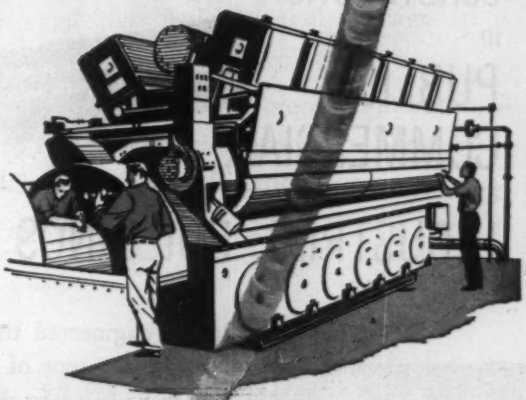
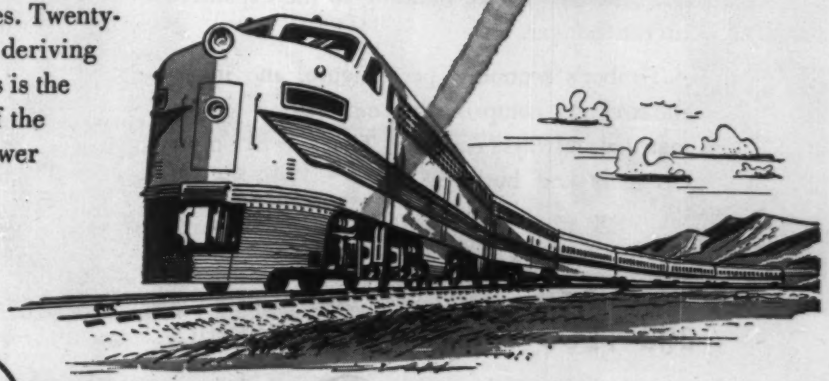
for your diesel!





Here is how the application of AiResearch Turbochargers can affect the performance of your mobile or stationary diesel equipment:

✶ Adds more power in relation to size and weight than any other units in this field.

✶ Decreases fuel consumption. Besides decreasing costs, this factor greatly increases the non-refueling range for mobile equipment.

✶ Provides power as needed by responding rapidly to acceleration requirements. This factor greatly decreases smoking.

✶ Maintains sea-level power under all altitude conditions.

✶ Greatly reduces the noise level of your equipment while eliminating power-wasting mufflers.

AiResearch is the largest producer of small turbomachinery in the United States. Twenty-five *million* hours of experience in deriving exceptional power from small units is the background for the development of the AiResearch Turbocharger. This power package was recently applied to Caterpillar diesel machinery with startlingly effective results.

Your inquiries are invited.

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Timber's economy, permanence, and inherent strength, comprise the combination seldom matched, always desired. That's why more designers and builders

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already open to traffic, the presence of volatile solvents was out of the question. Although the material is caustic and must be handled with some care, the Thruway Authority considers it safer from the overall point of view, and so far as can presently be determined, believes its effectiveness equals that of the solvent-dispersed silicone. The initial cost of the material is $295 per 55-gal drum of 20% stock solution.

• **Spray equipment**—A special spray rig for treating the bridges was built for the Thruway Authority by the Tarrant Manufacturing Co. of Saratoga Springs, N. Y. at a cost of about $1,200. It consists of a 275-gal tank mounted on skids and equipped with a rotary pump driven by a 5-hp gasoline engine. This pump feeds to a 14-ft spray bar made up of a 6-ft section and two independently controlled 4-ft sections to provide flexibility. There also are two hand spray bars for work in areas that cannot be reached by the main spray bars.

The flatbed truck that carries the rig is equipped with a "low-low-gear" to make possible an operating speed of about three miles an hour. This permits a coverage of about one gallon of the 2% silicone solution per 100 sq ft. Total range of deviation from this quantity is less than 5%.

A supply truck carries one or two 550-gal tanks and extra drums of silicone stock; and a third truck tows an air compressor used to remove dust from the concrete. Also, bridge decks are swept with rotary brushes in advance of treatment. This cleaning is necessary to insure that dust does not absorb much of the solution.

Better Rivets

High-strength alloy is developed for hot driving

A high-strength aluminum alloy rivet that is recommended for hot driving in such heavy-duty aluminum alloy structures as bridges, railroad cars, cranes and construction booms has just emerged from the research laboratory of the Aluminum Company of America. Designated No. 7277, the new alloy will extend design advantages beyond those previously possible in all-aluminum structures.

The specific characteristics of alloy 7277 are set forth in a report by Alcoa researchers M. W. Brennecke, W. J. Dewalt and W. Zeh. Advantages claimed for rivets of this alloy include: (1) a wide temperature range

Monotube Foundation Piles...

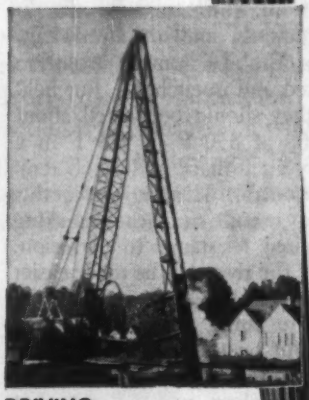
BEST START

for saving time—money—materials

IN today's highly competitive construction business, it's mighty important to invest time, money and materials as wisely as possible. That's why you'll want to learn more about *the best start* when building . . . tapered, fluted steel Monotube foundation piles.

Illustrated on this page are several examples of field work involving Monotube piles. With a fast, single girt weld of telescopic joints, Monotubes can be extended to any required length. Cut-offs are easy too . . . and no waste, as these same cut-offs can be re-used to extend other piles. Light-weight construction plus cold-rolled strength means easier handling and faster pile installation. Tubular design makes inspection before concreting quick and sure.

Mentioned above are only a few of the reasons why more and more foundation jobs are getting off to a good start using Monotube piles. To get *all* the facts, write The Union Metal Manufacturing Company, Canton 5, Ohio. Request Catalog No. 81.



DRIVING

EXTENDING

CUTTING OFF

INSPECTION

UNION METAL

Monotube Foundation Piles

"The most important thing I know about cranes is . . .

THIS ONE DOESN'T WEAR ME DOWN!"

Air-operated controls — and a crane that is always ready to go to work. Torque-Controls for smooth, accurate handling . . . and almost no clutch wear or adjustment. Short wheel base and only *six tires* so that it can turn and travel in any aisle big enough *for a truck.*

All ORTON cranes now have *Torque-Control*

- **Locomotive Cranes — Catalog No. 84**
- **Aero (Rubber Tired) Cranes — Catalog No. 85**
- **Powermatic (Crawler) Cranes — Catalog No. 87**

ORTON

CRANE & SHOVEL COMPANY
608 S. Dearborn St. • Chicago 5, Ill.

for driving, (2) driving pressures low enough to permit driving large diameter rivets with portable pneumatic hammers, and (3) ability to withstand a slow quench, with good resistance to corrosion and stress corrosion cracking.

The report recommends use of an ultimate shear strength of 38,000 psi on which design stress can be based. While strength of rivets tested increased to considerably higher values after a period of time, this was the conservative figure arrived at after making over 300 shear tests.

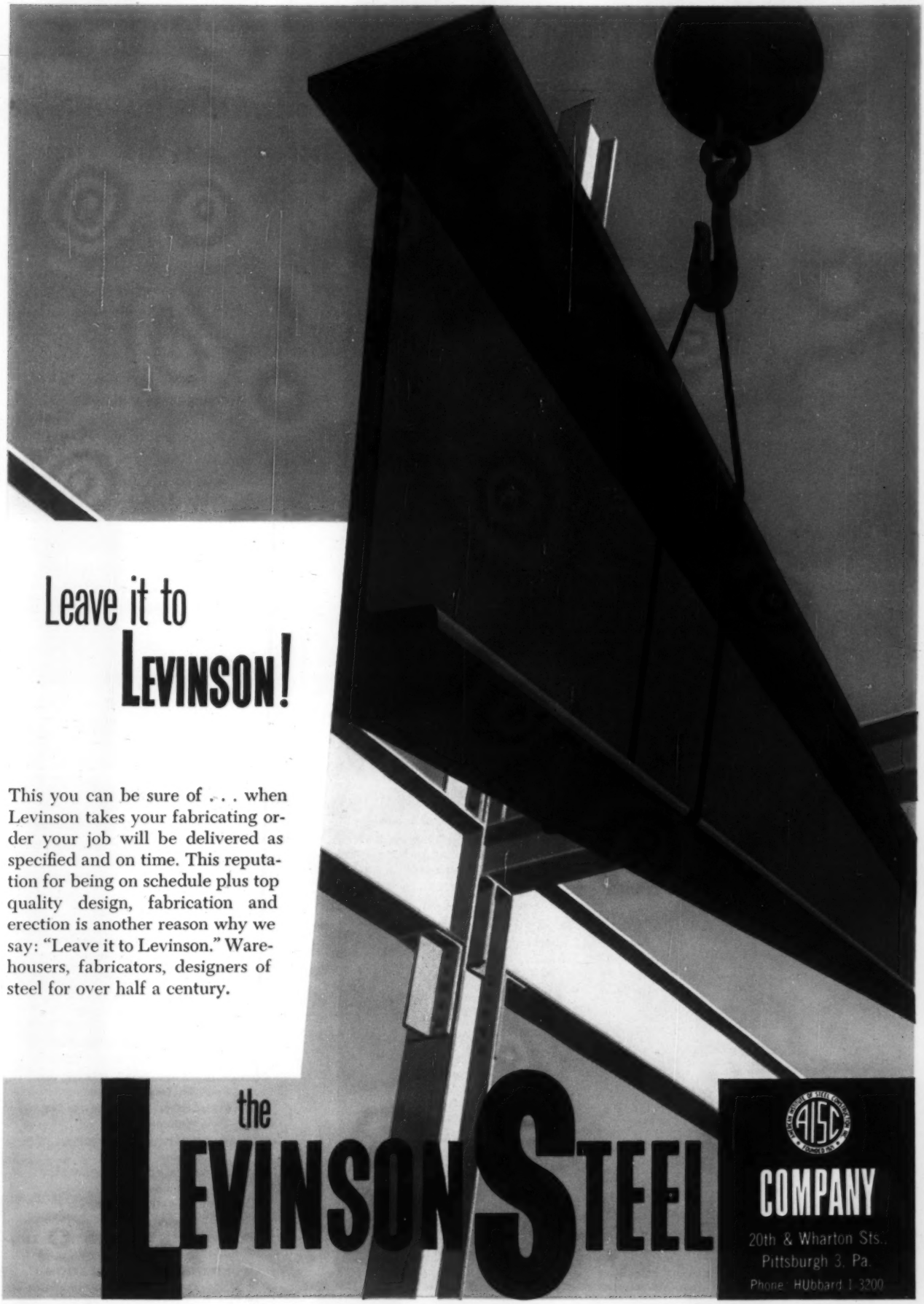
Recommended pressures for driving the new alloy rivets were found to be very close to those used for driving steel rivets of comparable size. Only in the larger sizes ($\frac{7}{8}$ and 1-in. dia.) was there found to be any variation; with the alloy rivets requiring somewhat higher pressures, 56 tons compared with 49 tons for steel. As with steel rivets, the shape of the head has an important bearing on these values. Pressures required are about five times higher for button head rivets than cone-point heads.

The generally good resistance to corrosion of 7277 was shown by the appearance of riveted joints exposed for four years to the seacoast atmosphere at Point Judith, R. I., and two years to the seawater by tidewater immersion at Miami, Fla. These showed normal weathering and only mild general attack of the rivets.

Unprotected steel and aluminum joints exposed for two years to sea water by tidewater immersion at Miami showed the most severe stress corrosion cracking.

The new rivets are available in sizes ranging from $\frac{1}{2}$-in. to 1-in. dia in $\frac{1}{8}$-in. increments, and are always furnished in the T4 temper (solution heat-treated and quenched). For field riveting they should be heated about 15 minutes at 850 F to 975 F in a circulatory air furnace with good temperature control. Heating above this range may result in head cracking and impaired resistance to corrosion. Driving of the rivet will be made easier by heating in the high end of the temperature range, by little delay in driving, and by the use of tools and equipment of the proper size.

The researchers pointed out that rivets of alloy 7277 can be driven with any of the conventional rivet-driving equipment in use today and with any type of driven head. Smaller sizes of driven heads, such as the cone-point type should be used to maintain the lowest driving pressure where ease of driving is important.



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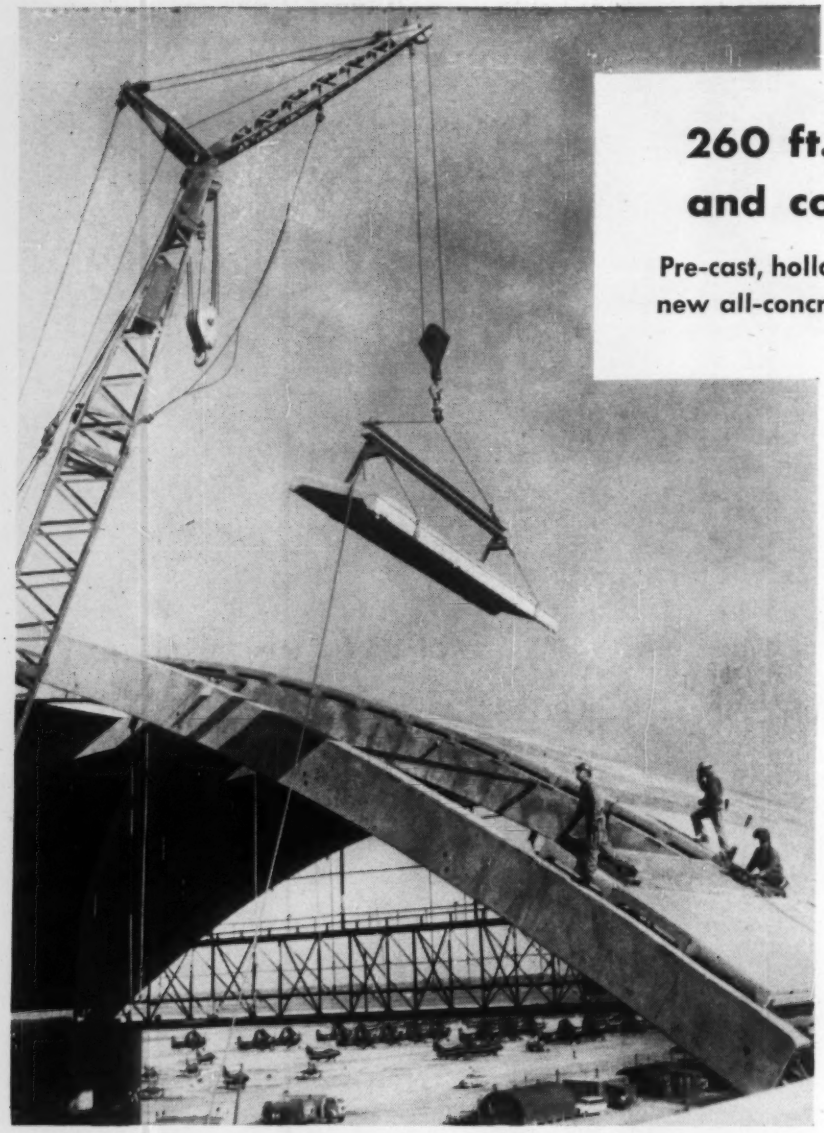
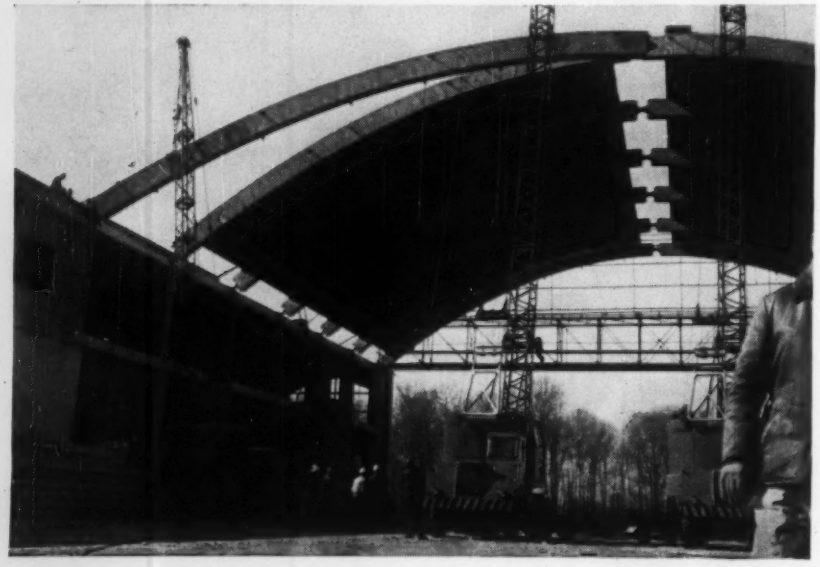


Oceana Naval Air Station, Virginia; Official U. S. Navy Photos

The pre-cast arch beams are 3′ deep by 1¾′ wide and have maximum reinforcement of ten 1⅛″ sq. bars at top and bottom. Ends were hinged for erection and later fixed by welding the reinforcing. Roof panels are 1¼″ thick, reinforced with steel mesh and 10″ ribs. Virginia Engineering Company, Inc., Contractors.



260 ft. long, 150 ft. wide, and concrete all the way

Pre-cast, hollow beams and thin shell panels roof new all-concrete jet hangar at Navy air station.

To take advantage of its lower cost of maintenance, U.S. Navy engineers are doing pace-setting work with all-concrete construction.

On the conventionally poured footings and abutments of this hangar, hollow roof arches were erected by casting them in halves, on the site, and raising with cranes. They span 150′ with a 30′ parabolic rise. They are tied together by the 24′ x 4′ pre-cast thin shell roof panels.

The 5000 psi-28 day concrete specified for this work was processed in truck mixers of certified design, capacity, mixing speed and accuracy of water control.

You have a right to insist on this Rating Plate. It certifies compliance with the high industry standards maintained for your protection by the Truck Mixer Manufacturers Bureau.

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MEN AND JOBS

Harvey O. Banks

New State Engineer

Banks in California post on temporary appointment

Harvey O. Banks, assistant state engineer, has been named temporarily to the post of California State Engineer pending selection of a permanent successor to A. D. Edmonston, who retired Nov. 1 (ENR, Sept. 29, p. 291).

In making known his selection of Banks, State Director of Public Works Frank B. Durkee, announced appointments of two principal hydraulic engineers to other vacancies caused by November retirements. Walter G. Schulz assumes the duties of Gerald H. Jones, assistant state engineer in charge of flood control projects and supervision of the safety of dams, and William L. Berry succeeds Thomas B. Waddell, assistant state engineer in charge of water project investigations.

During his interin appointment, Banks will continue with his regular duties as assistant state engineer in charge of water rights and water quality investigations, a post to which he was promoted in 1953.

Until he went on active duty in World War II, Banks served as an assistant hydraulic engineer with the California division of water resources in Los Angeles. He returned as an associate hydraulic engineer for the state and became a principal hydraulic engineer in 1950, after spending

ROGERS TRAILER DUO in 140 Ton Haul

The "know how" required for the moving and installation of heavy industrial products requires a knowledge of the characteristics and adaptability of the equipment used as well as the "tricks of the trade."

For the handling of this 140 ton transformer for the New York Consolidated Edison Company, Gerosa Haulage Company of New York, chose from their fleet of 20 Rogers Trailers these two 80 ton units.

The transformer was moved in by barge, picked up by a lighter derrick and placed astride the two Rogers trailers which hauled them to the power plant. An ingenious operation by master haulers and erectors.

By reason of repeated instances such as this over many years, Rogers Trailers are identified with a majority of such difficult and interesting heavy moves.

Get the interesting, illustrated catalog.

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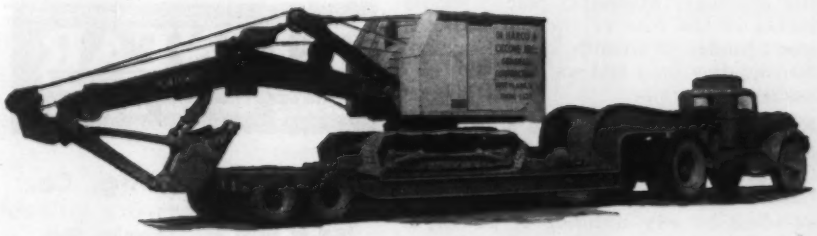
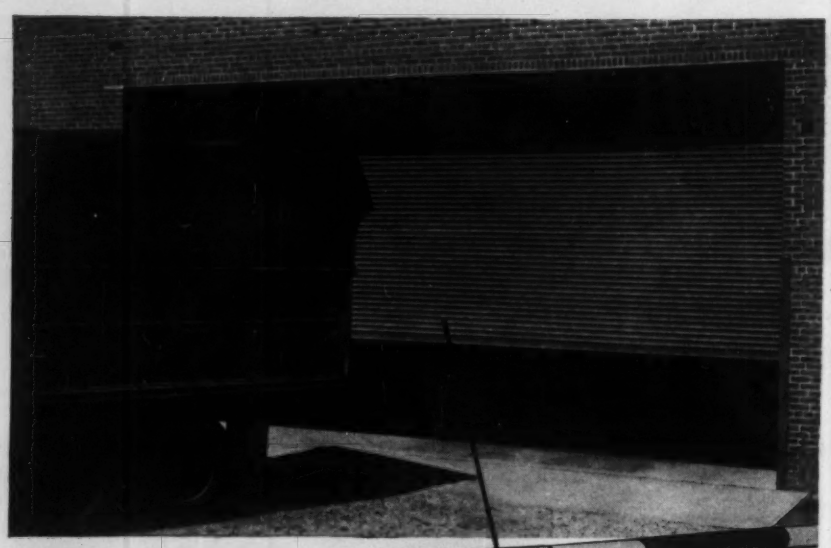
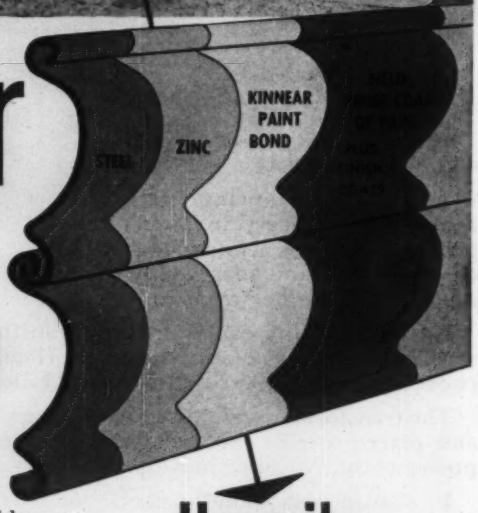


A Rogers Type "D" Trailer



Kinnear Steel Rolling Doors



Kinnear Rolling Doors are as well known for *extra years of service* as for convenience, space-economy and protection.

Two of the major reasons for this are shown in the drawing above at right.

The rugged interlocking steel slats are *heavily* galvanized — with 1.25 ounces of pure zinc per square foot of metal, by ASTM standards.

Then Kinnear's Paint Bond, a special phosphate solution is applied to make sure paint applied later will *cover thoroughly, adhere immediately, and stay on longer.*

That's why Kinnear Rolling Doors cut maintenance costs to the bone, and deliver peak efficiency year after year!

Opening straight upward, Kinnear Rolling Doors coil compactly *out of the way* above the doorway. Materials placed within inches of the face of the door curtain won't hinder its smooth, easy operation. Surrounding floor and wall space is fully usable at all times.

Kinnear Rolling Doors are built to fit openings of any size. Kinnear Motor Operators add the convenience of push-button control, with remote-control switches at any number of points, if desired.

Write for the latest Kinnear Catalog!

Heavily Galvanized

No *wonder* users report 30, 40 and 50 years of *efficient, daily* service from

KINNEAR
ROLLING DOORS
Saving Ways in Doorways

The KINNEAR Mfg. Co.

FACTORIES:
1820-40 Fields Ave., Columbus, Ohio
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four years in private practice with Harold Conkling, Los Angeles consulting engineer.

A civil engineering graduate of Syracuse University, Banks has a master's degree in hydraulic and sanitary engineering from Stanford University.

M-C&S Announces Changes In Construction Department

The New York headquarters of Merritt-Chapman & Scott Corp. has announced a number of changes in the firm's Construction Department, now under the supervision of executive vice president William Denny.

Richard E. Mynatt, an assistant to Denny since 1953, has been elected a vice president in charge of administration for the Construction Department. During his 17 years with the firm, he has served successively as office manager, purchasing agent, executive assistant on major projects and manager of the Construction Equipment Division.

At the same time, because of the growth in the company's marine and heavy construction activities in the Boston area, the Construction Department has established an area office in Boston, with vice president Charles A. Richardson in charge.

For the past three years, Richardson, who has been with M-C&S both in Boston and New York since 1935, has had charge of the New York Marine and Heavy Construction Division. That post will now be assumed by Frank R. Creedon, who came to the company last spring from Uhl, Hall & Rich, Boston engineering firm.

Richard E. Mynatt

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling

on Georgia Dam Project

Wade Lahar Construction Company, Mountain Home, Arkansas, have been awarded the U.S. Engineers Contract for clearing 23,500 acres at Buford Dam, Buford, Georgia, a multi-million dollar project. Note the special cutter and safety canopy which were designed by Mr. Wade Lahar, President, to cut down trees even with the ground. Gulf products are helping this contractor stay well ahead of schedule on this big project.

With higher than ever operating costs threatening every dollar of your profits, it will pay you to take stock of the advantages Gulf offers as a supplier of petroleum products.

Advantages like these, for example: Prompt delivery service from close-at-hand distribution points; quality lubricants that provide an extra margin of protection against mechanical delays; fuels that insure top engine performance; and helpful petroleum engineering counsel.

You will find, as have so many leading contractors—ask the Wade Lahar Construction Company, for example—that these advantages add up to smoother operation, greater production, and lower maintenance costs.

Send the coupon for a copy of Gulf's new brochure, "Gulf and Your Business."

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Please send me a copy of your new brochure, "Gulf and Your Business."

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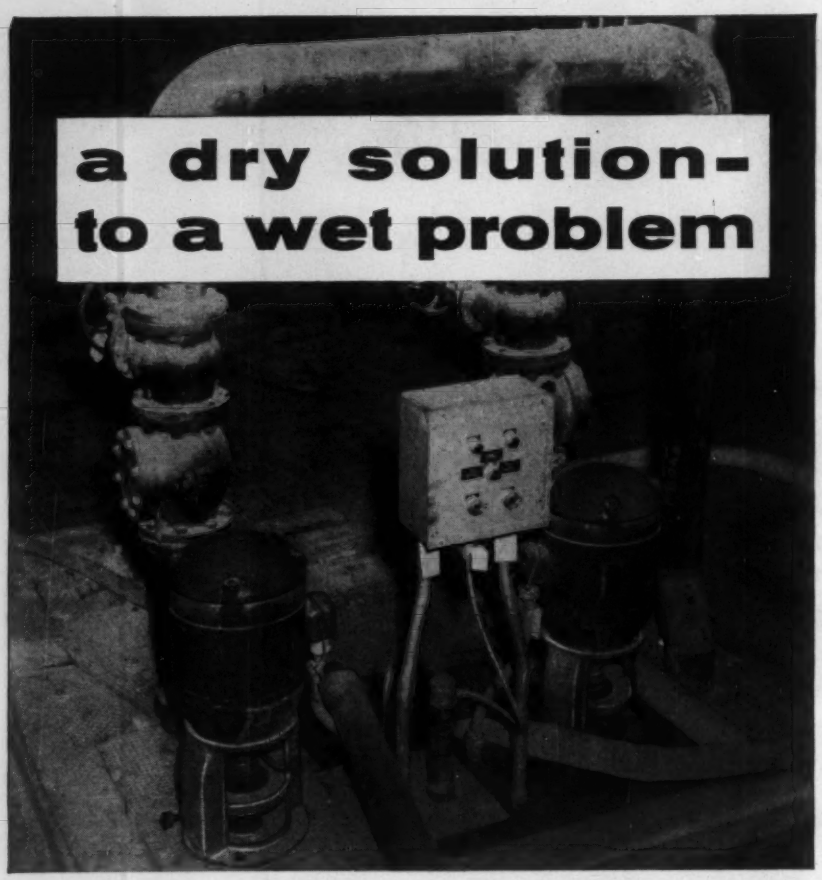

A large-volume user of water had a "wet plant problem." The solution is pictured above. Here you see two Deming Vertical Sump Pumps each with a 10 HP motor. Each pump has a rated capacity of 500 GPM with a 50-foot head. Unwanted water from all areas of the plant drains into a pit. When water in the pit rises to a predetermined level, one of the Deming Sump Pumps goes into action automatically. Or, if required, both pumps can be used simultaneously. If you have a "wet plant problem" there's a Deming Distributor near you to help you solve it.

DUPLEX UNITS

Where conditions require two pumps to operate separately, in sequence, or simultaneously, Deming Vertical Sump Pumps can be furnished as Duplex Units. The complete line includes a wide range of single and duplex units to meet most sump pump requirements. Write for illustrated BULLETIN 4600-A.

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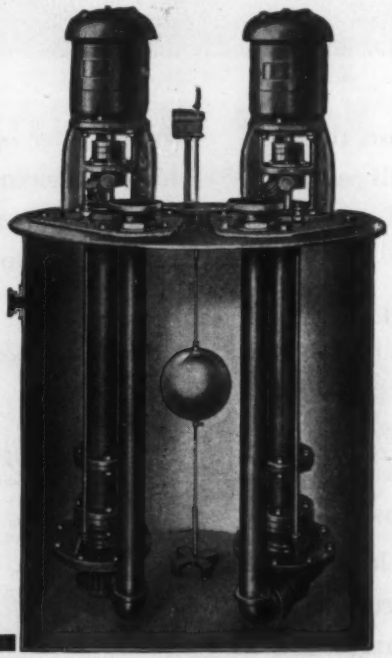


MEN AND JOBS

Koppers Company Engineers Change Construction Jobs

A. B. Fisher, Jr., has been appointed assistant manager of production in the Engineering and Construction Division of Koppers Company, Inc., Pittsburgh, Pa.

He joined Koppers as a draftsman in 1926 and was named general superintendent of construction last year.

As a result of his appointment, R. K. Matthews, a former erecting engineer, has been promoted from assistant general superintendent of construction to general superintendent of construction.

Koppers' Engineering and Construction Division is primarily engaged in the design and construction of facilities used in the gas, oil and coke industries.

Construction Service Award To F. Stuart Fitzpatrick

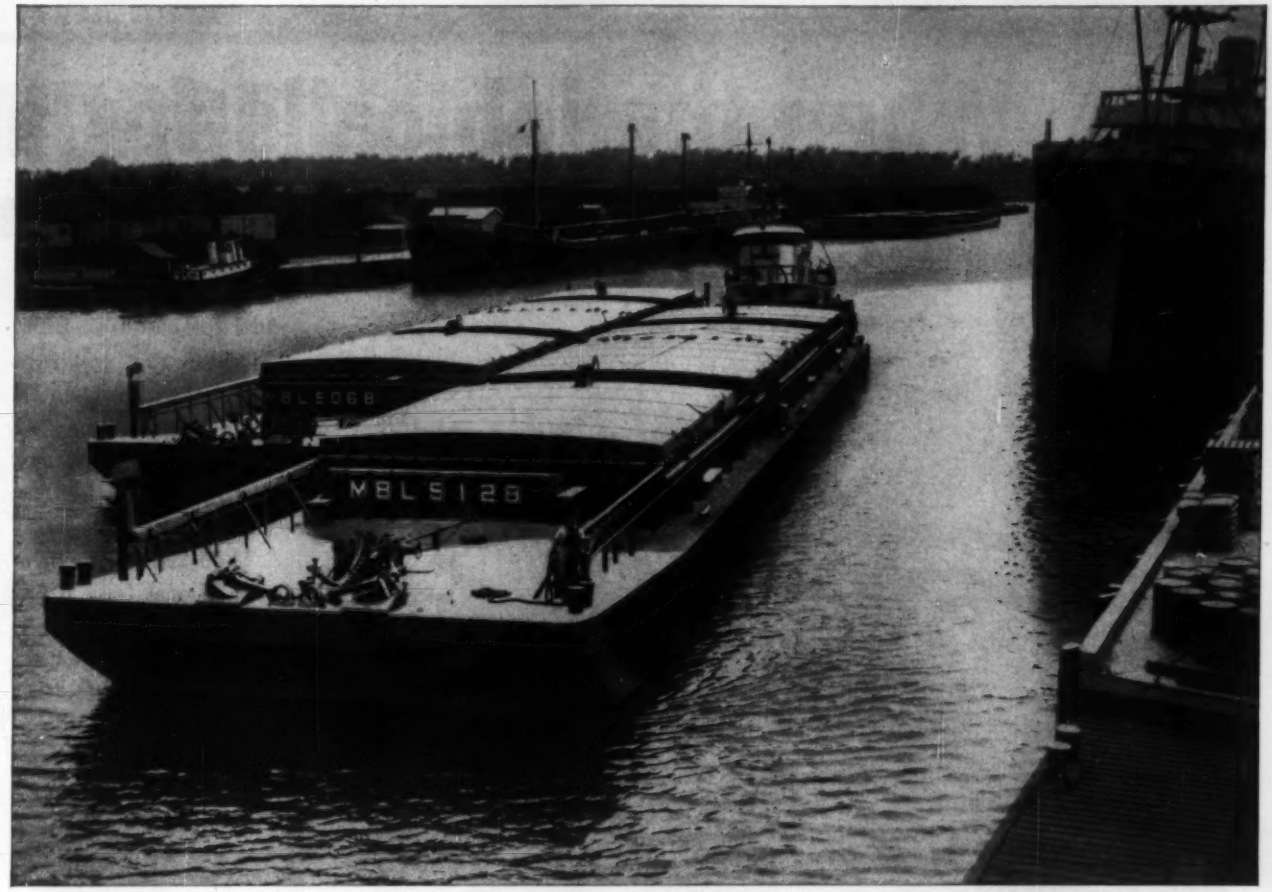
The Producers' Council, Inc., an organization of building material and equipment manufacturers and associations celebrating its 35th anniversary this year, has presented its Award of Recognition for Outstanding Service to the Construction Industry to F. Stuart Fitzpatrick, manager of the Construction and Civic Development Department of the U. S. Chamber of Commerce.

Fitzpatrick, who becomes the third holder of the award, has been with the national chamber for 37 years. During this period, he organized the chamber's Trade Association and Construction Civic Development Departments, and was instrumental in setting up the Building Research Advisory Board and the Building Research Institute.

Freeman Fellowship Open To ASCE or ASME Members

David W. R. Morgan, president of the American Society of Mechanical Engineers, has announced the availability of the 1956 Freeman Fellowship for study or research in hydraulics.

Any qualified member of ASCE or ASME may apply for the fellowship if he is a United States citizen. Preference will be given to applicants working on defense projects. Amont of the grant may reach $3,000, depending on the need claimed in the application. Those interested may apply to the Freeman Award Committee, c/o Secretary, The American Society of Mechanical Engineers, 29 West 39th St., New York 18, N. Y. Winner will be announced March 15.



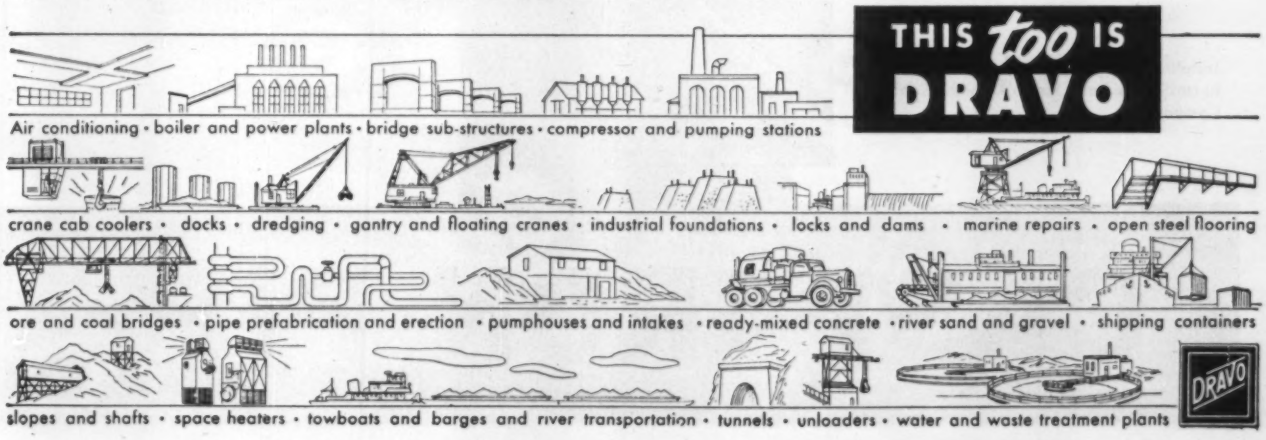
BARGES BOOST FLORIDA-MIDWEST COMMERCE

Twelve new barges now in operation on U. S. waterways are providing through service shipment of low-cost bulk commodities between Florida and the Midwest.

Formerly the high cost of transferring cargo from deep water vessels to river barges, as well as time lost in warehousing, made all-water transportation non-competitive.

Recognizing the future in this business if such expenses could be eliminated, officials of the A. L. Mechling Barge Lines, Inc., Joliet, Illinois, met with representatives of Dravo Corporation. In "Round Table" discussions, exchange of technical and operating information led to a new barge design which incorporated both the structural strength necessary in deep water operation and the low resistance and shallow draft required in the inland waterways.

Dravo has played an important part in many such projects aimed at furthering water transportation progress. This is another example of more than 60 years of service to business and industry in many fields, with customer satisfaction considered essential in every transaction. For more information write DRAVO CORPORATION, PITTSBURGH 25, PENNA.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Air conditioning • boiler and power plants • bridge sub-structures • compressor and pumping stations
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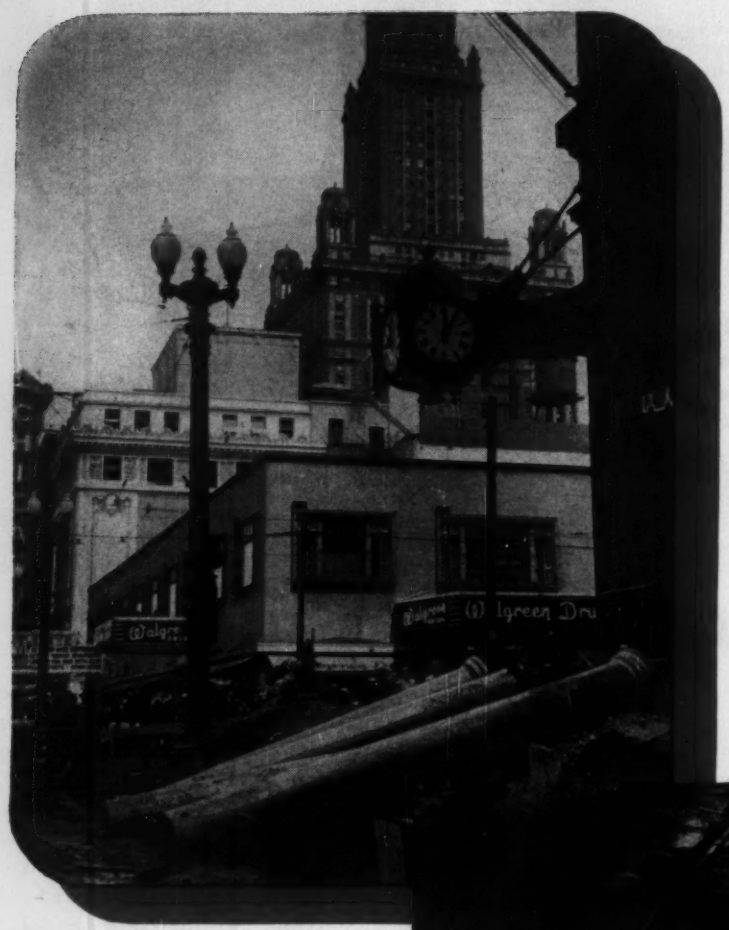
DRAVO

When the job calls for a



Cast iron pipe water line installed in front of Marshall Field's in Chicago during subway construction.

Rugged *is* the word for cast iron pipe. When you stop to think that cast iron water and gas mains—cast without benefit of modern metallurgical science and production skills – are in their *second century* of service in over sixty American cities, you agree that rugged *is* the word for cast iron pipe. Then, take note of the fact that *modernized* cast iron pipe, centrifugally cast, is even tougher, stronger and more uniform in quality, than the product of a century ago. For further information, write Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Avenue, Chicago 3.

CAST Q IRON

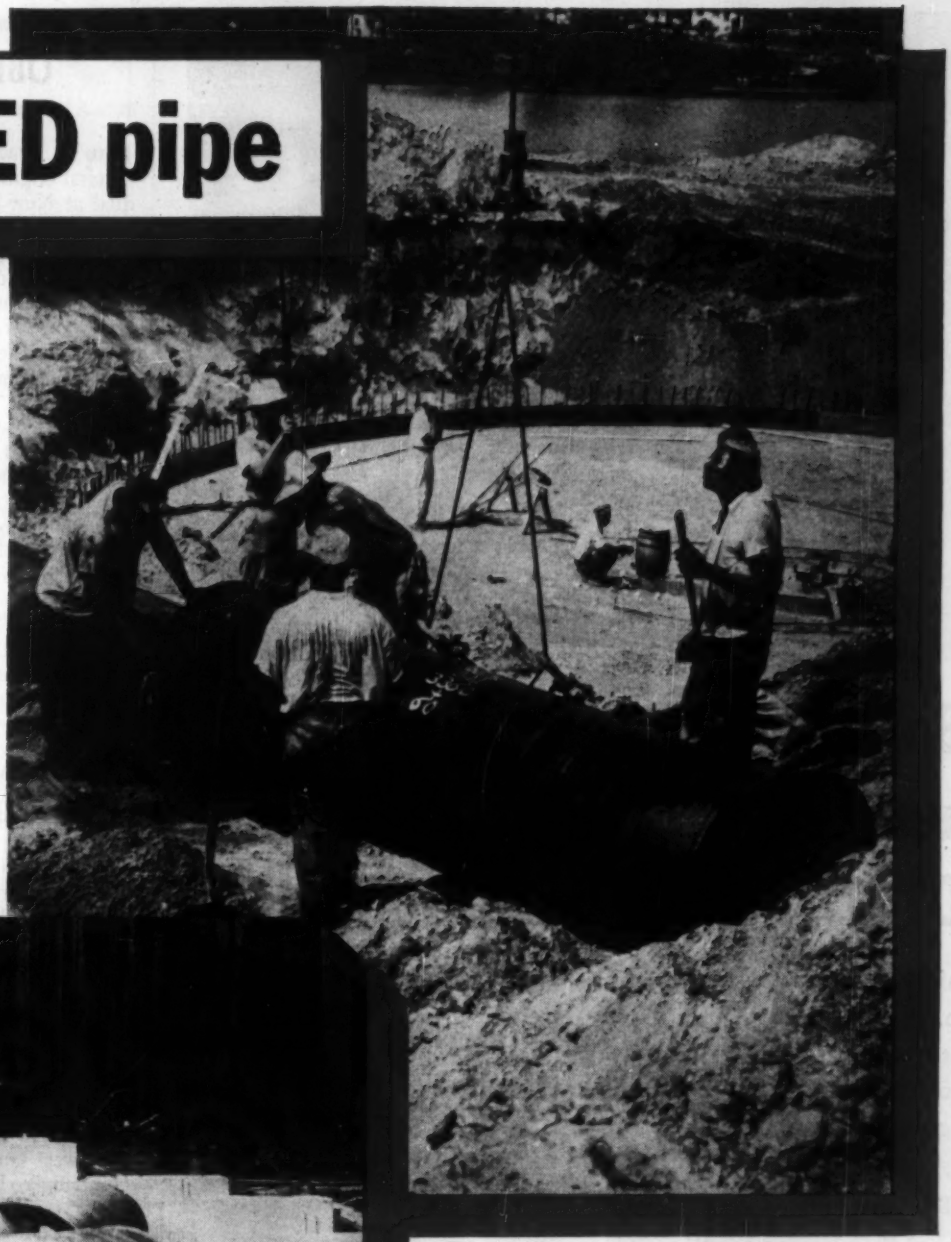
The Q-Check stencilled on pipe is the Registered Service Mark of the Cast Iron Pipe Research Association.

Installing mechanical joint cast iron pipe to carry mine water for an Alabama Coal Company.

24-inch mechanical joint cast iron pipe for gas supply line at Skokie, Ill.

CAST IRON PIPE

RUGGED pipe



Laying 30-inch cast iron pipe for sewage treatment plant at Panama City, Florida.

Cast iron pipe line on piers to maintain grade from sewage treatment plant to outfall—at Durham, N. C.

SERVES FOR CENTURIES...

"Baby Digger" truck loads in close quarters – has big capacity, digs 10"-20" wide, down to 5' deep

This East Ohio Gas Company job, the replacement of a main extension, shows why the Cleveland Model 92 "Baby Digger" is so widely used for city digging. The "92" puts the edge of a trench within 17 inches of a parallel wall, loads excess spoil directly into trucks at the curb, and affords the operator full visibility of the whole job.

Compactness, maneuverability, speed combinations, capacity—if most of your trenching jobs are city jobs, the "92" is the trencher for you!

And does it get around! The "92" hustles safely from job to job . . . at legal limit speeds . . . because it's so easily portable on the drop-axle, tilt-bed Cleveland T5 Trailer.

Your local distributor will show you how Clevelands do more—for less

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CLEVELAND

OBITUARIES

John C. Tracy, 85, professor emeritus of civil engineering at Yale University died at New Haven Nov. 1, two days prior to his 86 birthday. He served as structural draftsman for the King Bridge Co. of Cleveland, Ohio. He was an instructor of civil engineering at Yale 1891-1902, assistant professor of structural engineering at Yale, 1902-1915; professor of civil engineering & chairman of the department at Yale from 1915 until 1936 when he retired. From 1936 until his death, Tracy was professor of civil engineering and author of several books namely "Introductory Course in Mechanical Drawing," "Plane Surveying," "Exercises in Surveying," "Descriptive Geometry," and "Stresses Statically Determined." Dr. Tracy was a member of American Society of Civil Engineers, Connecticut Society of Civil Engineers and the Yale Engineering Association.

John W. Alden, 71, former New Castle County, Del., engineer, died Oct. 24 in Sharon Hill, Pa. He also had served twice as county engineer at Wilmington, Del.—from 1937 to 1945 and from 1947 to 1949. Since 1949 he had been working as a consulting engineer with Damon & Foster of Sharon Hill. He was graduated from the University of Delaware in 1910 with a degree in civil engineering. Early in his career he held engineering posts in South America. Then he worked on development of a water works project for Tennessee Coal, Iron & Railroad Co. at Birmingham, Ala., and was sanitary engineer with the company's health department. For nine years he served as construction superintendent for the Wilmington-Philadelphia Traction Co.

Richard C. White, 70, former city engineer of Buffalo, N. Y., died Nov. 5. He was a commander in the U. S. Navy and a graduate of the United States Naval Academy. White served as WPA engineer for Western New York. He also served as city engineer for Buffalo in 1942 and, in 1945, became chief engineer for the Grade Crossing & Terminal Commission. In recent years, White served as a consulting engineer.

Albert E. Kleinert, 65, civil engineer for the Massachusetts Department of Public Works, died in Boston, Oct. 23. He was a bridge design specialist for the department and also was active in the field of soil mechanics research. He retired in 1948.

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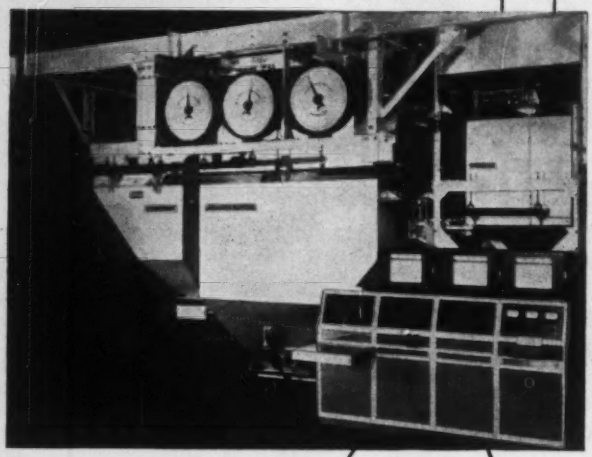

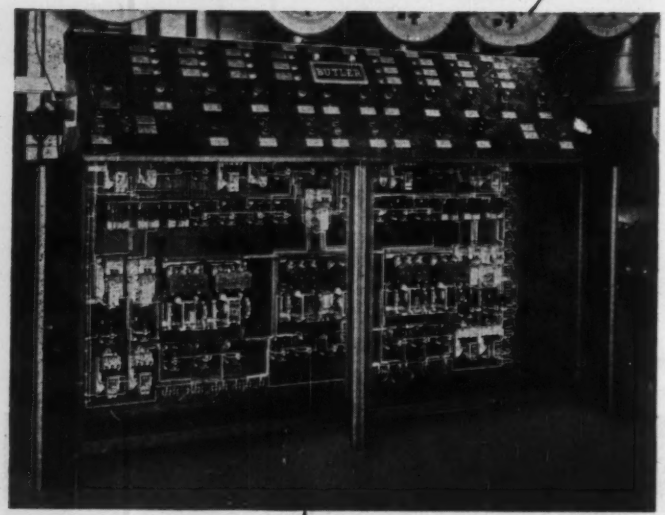

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The National Merit Scholarship Corporation

Business is Offered Big Dividends on Investment in Higher Education

The McGraw-Hill Publishing Company is availing itself of the opportunity to establish ten National Merit Scholarships. They will be known as the McGraw-Hill Merit Scholarships. The scholarships are to be awarded to qualified candidates for a four-year college course in the fields of science, engineering and the other professions and the liberal arts. There will be no limitation, beyond the appropriate professional accrediting, on the college or university selected by a successful candidate. As part of a continuing program to aid higher education and educational institutions, McGraw-Hill is happy to be able to share in what it believes to be the constructive educational endeavor of the National Merit Scholarship Corporation.

Business firms searching for a satisfactory avenue to provide financial aid for our colleges and universities now have a new opportunity of major importance. It is provided by the National Merit Scholarship Corporation, which has offered to devote $8 million to matching, dollar for dollar, gifts by business firms for college scholarships and supplemental gifts to the institutions where the scholarships are used.

The National Merit Scholarship Corporation, an independent agency financed initially by gifts of $20 million from the Ford Foundation and $500,000 from the Carnegie Corporation, has three major purposes which are closely related. They are:

1. To locate those of the nation's young men and young women who are best equipped to go to college.

2. When necessary, to help these young people go to college by giving them financial aid.

3. To help colleges and universities meet the full cost of the instruction of those to whom National Merit scholarships are granted.

At present about half of the nation's top high school graduates do not go to college. The principal reason is that they do not have the money required.

To Save Unused Brain Power

The National Merit Scholarship Corporation will strive to eliminate this dangerous neglect of top-flight ability. To this end it is inviting the nation's high schools, numbering more than 24,000, to participate in its program by designating as available candidates for National Merit scholarships the top 5 percent of their senior classes. Those so designated are then invited to take a series of tests and to submit reports designed to assure selection of the very best talent in each state. The number of scholarships to be allotted to each state will be proportionate to the number of high school graduates in the state.

The winners, the total number of whom will be determined by the amount of money the Scholarship Corporation has available, will be eligible for awards. For those who need no financial help to go to college there will be honorary awards of $100. For those who must have help the Corporation will grant scholarships covering as much as necessary

of the cost of instruction and living expenses for a four-year college course.

Colleges Get Financial Help

The provision of funds to cover the students' expenses does not, however, solve the financial problems faced by many colleges. That is because the tuition charges paid by the students do not cover the cost of the instruction. The deficit must be met by drawing upon endowment funds, gifts, grants, and other available sources.

Consequently, to prevent holders of National Merit scholarships from imposing any additional financial burden on the colleges and universities they elect to attend, the Corporation will make a supplementary grant to these institutions. The supplementary grant will be the equivalent of regular tuition charges made by the school, with a top limit of $1,500 a year for both the tuition and the supplement.

As the scholarship grants to the winning students will vary, depending upon how much financial help they need, so will the supplementary grants vary from one college to another, depending on their regular tuition charges. However, it is anticipated that on the average the full cost of a National Merit scholarship—including aid to the student and the supplement to the college—will be about $1,500 a year.

Many business firms will find a compelling appeal in a program which is designed at once to mobilize the nation's intellectual resources more effectively and, in the process, give very badly needed financial help to our colleges and universities.

Two For One Return Offered

However, there are numerous other inducements to business firms to finance National Merit scholarships. These scholarships may:

1. Carry the name of the firm or be named in honor of someone designated by the firm.
2. Be limited to use in types of colleges of particular interest to the sponsoring firm.
3. Be limited to a college course, such as science, engineering or liberal arts, of special concern to the sponsor.
4. Be restricted to candidates or institutions in geographic areas specified by the sponsor.

In addition to these advantages there is a special financial inducement to help the Merit Scholarship program. It is that for every Merit scholarship a firm or individual finances, the Corporation will, up to the limit of $8 million, match the funds and make another National Merit scholarship available.

There are many good ways of helping our financially beleaguered colleges and universities, and many corporations are already using one or more of them.* For those companies that can do so without embarrassing complications one of the best ways is to make unrestricted gifts directly to the institutions. But this new way provided by the creation of the National Merit Scholarship Corporation (Address: 1580 Sherman Avenue, Evanston, Illinois) has the broad appeal of serving two purposes of transcendent importance simultaneously. The purposes are to see that our best brains are fully trained and utilized and that our colleges and universities, crucial contributors to this process, are helped at the same time. Business will serve the nation and its own community well by giving the National Merit Scholarship Corporation generous help.

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* These, as well as the plight of our colleges and universities, are discussed in a pamphlet, "Business Aid to Our Colleges and Universities," which embodies a series of five editorials which appeared in all McGraw-Hill publications. Copies of the pamphlet can be obtained without charge by addressing the Department of Economics, McGraw-Hill Publishing Company, Inc., 330 West 42nd Street, New York 36, New York.

Methods of helping our colleges and universities financially are also outlined and discussed in a pamphlet, "Aids to Corporate Support of Higher Education," which may be obtained without cost by addressing the Council for Financial Aid to Education, 6 East 45th Street, New York 17, New York.

This message is one of a series prepared by the McGraw-Hill Department of Economics to help increase public knowledge and understanding of important nationwide developments that are of particular concern to the business and professional community served by our industrial and technical publications.

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Donald C. McGraw

PRESIDENT

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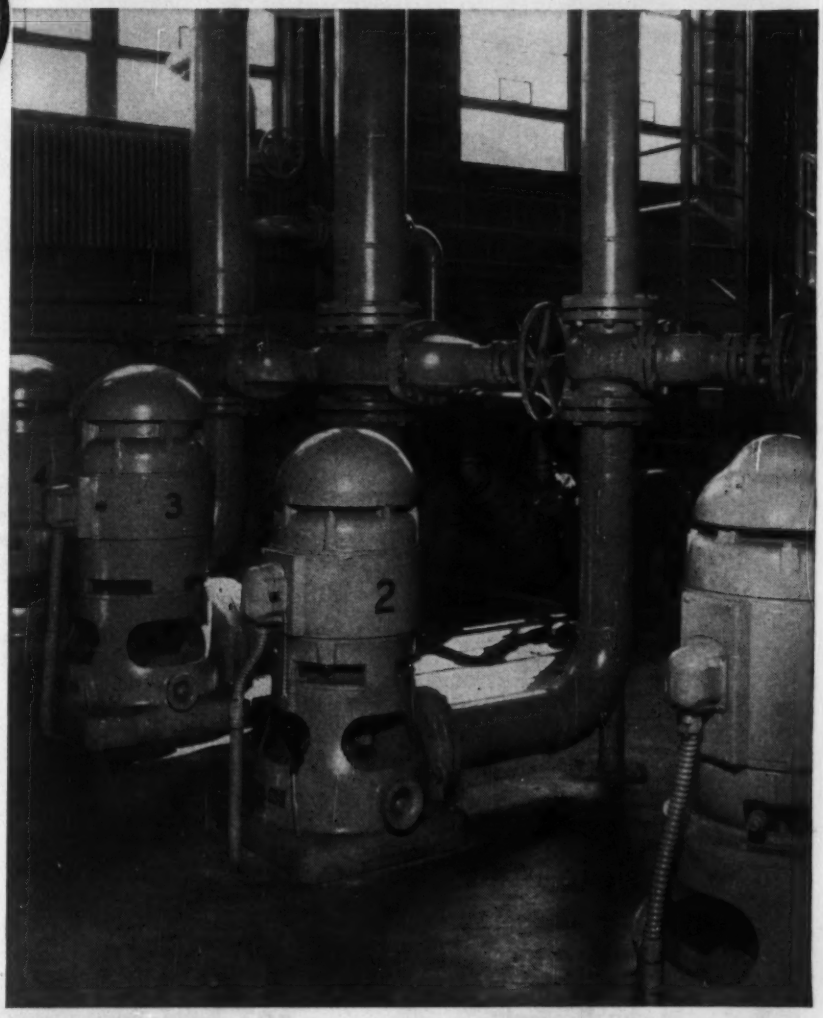

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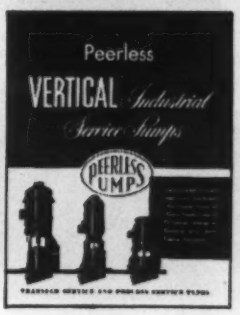

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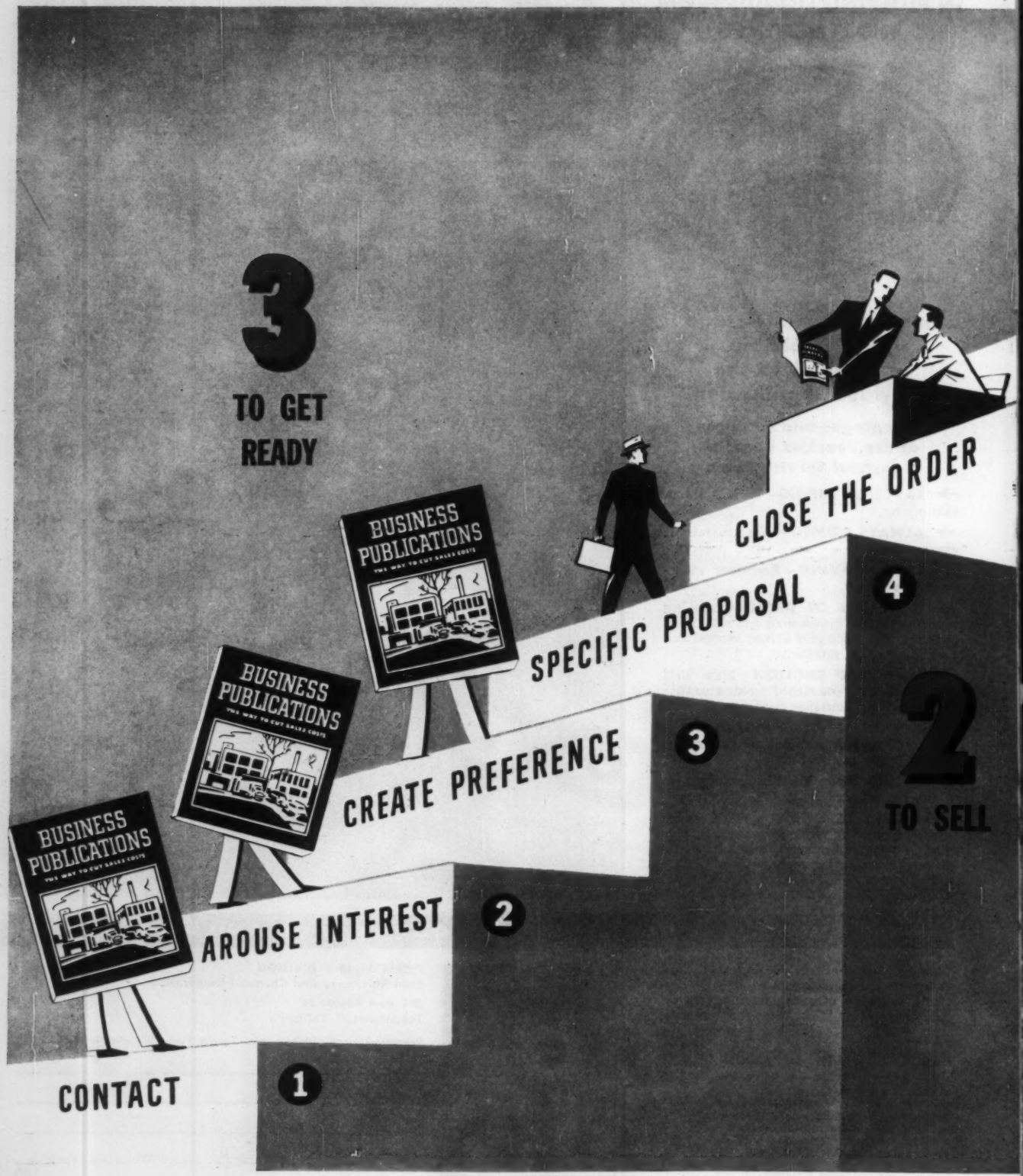
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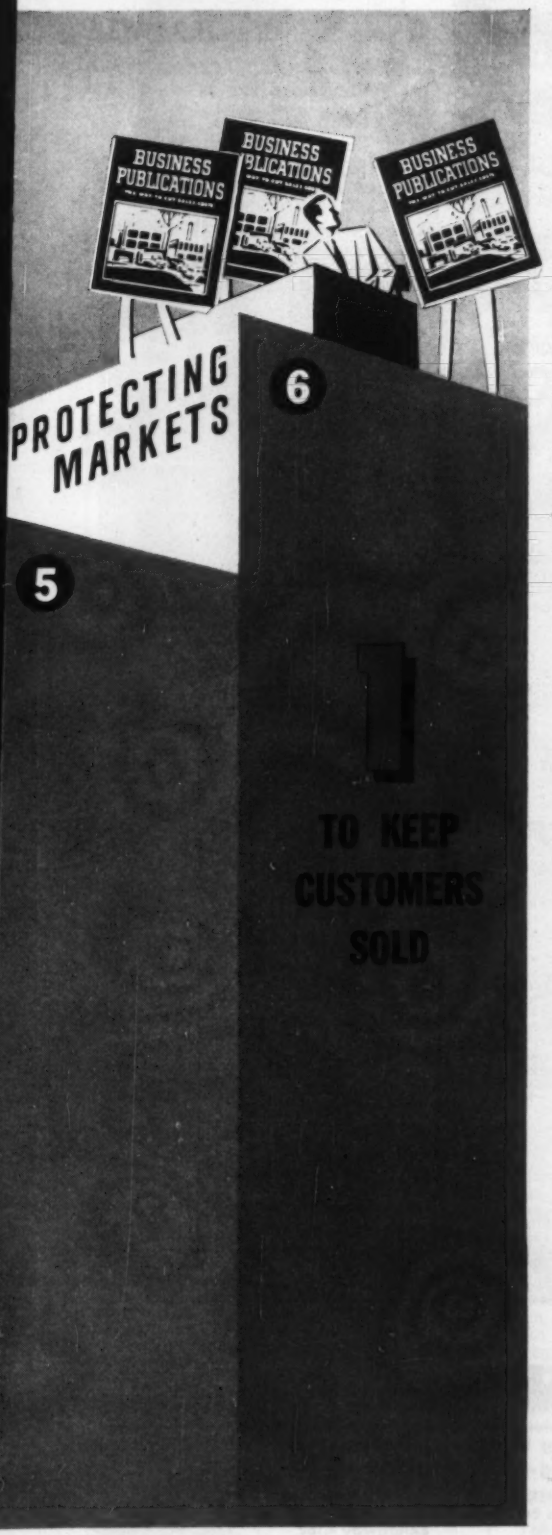

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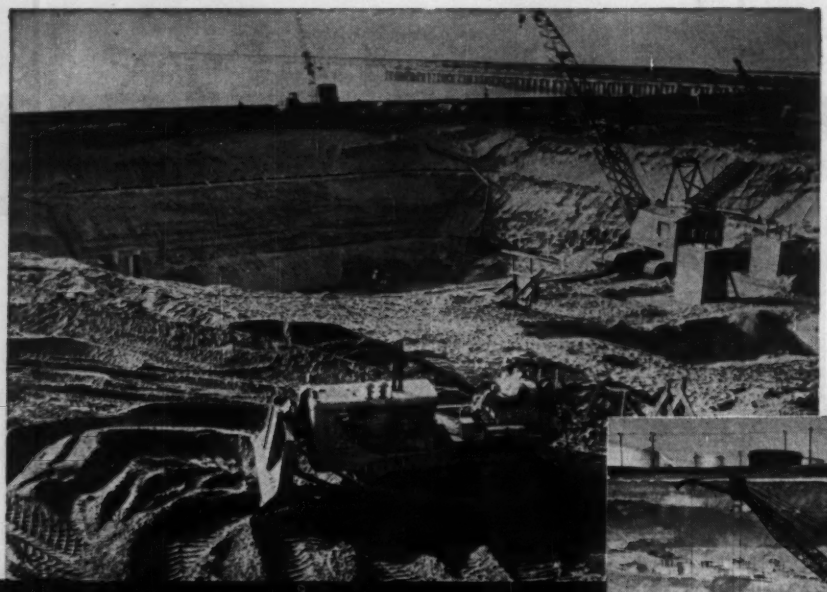

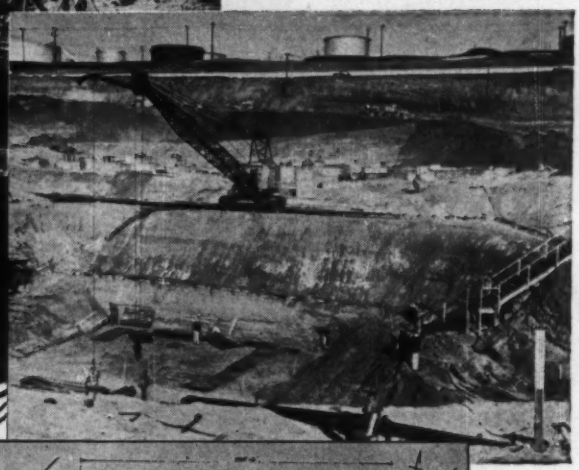

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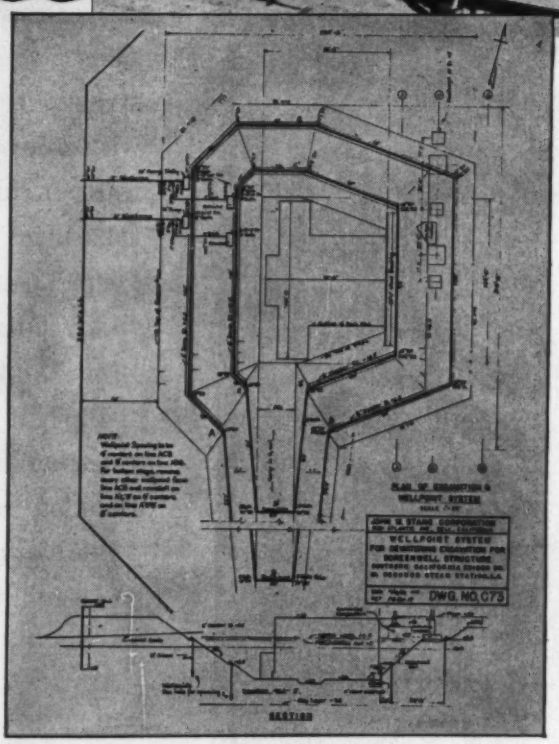

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J. A. MAHONEY, M. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

HEAVY CONSTRUCTION—BA

Mass., Boston—BA 12/1—Commonwealth of Mass., Metropolitan Dist. Comn., Water Div., 20 Somerset St., Boston, Proj. 217, furnishing, laying water pipes, Brookline and West Roxbury. $150,000. CD 10/21/52.

† Me., Bangor—FIRE STATION, etc.—BA On Or About 12/9—U. S. Eng., 857 Commonwealth Ave., Boston 15, Mass., fire station crash and structural bldg., Dow Air Force Base, ENG-19-016-56-65. $200,000-$300,000. Plans deposit $10.

BUILDINGS—BA

Vt., Middlebury — HIGH SCHOOL — BA 12/6 — Union School Dist., Ralph A. Eton, supt., Middlebury, Union High School, Otis Property. $900,000-$950,000. Plans deposit $50. Perkins & Will, 171 E. Post Rd., White Plains, N. Y., archts. CD 12/14/54.

† R. I., Newport—BARRACKS—BA 12/28—Dist. P. Wks. Office, First Naval Dist., 495 Summer St., Boston 10, Mass., permanent barracks, Naval Station, NOY 89976, Spec. 47525. Plans deposit $30. CD 8/11/54.

HEAVY CONSTRUCTION—LB & CA

▲ MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Berke Moore Co., Inc., 8 Newbury St., Boston, Mass. CA $2,242,260, est. $2,100,000. hy. and bridge, U-342, Everett. CD 10/31, under LB.

▲† J. Rich Steers, Inc., 17 Battery Place, New York, N. Y. and Morrison-Knudsen Co., Inc., 122 E. 42 St., New York, N. Y. CA $16,431,000. two Texas Tower offshore radar warning and weather stations, in Atlantic Ocean, off New England Coast, NOY 88202, Spec. 47141, MASSACHUSETTS. First Naval Dist., 495 Summer St., Boston, Mass. CD 11/4, under LB.

† U. S. Eng., 857 Commonwealth Ave., Boston, Mass. rejected bids Aug. 26, Special AAA Facilities, Beverly Airport and Brimball Hill Reservoir, ENG-19-016-56-11, MASSACHUSETTS. LB $849,771. Will readvertise.

George Allen & Co., 205 85th St., New York, N. Y., LB $305,167, est. $300,000, furnish, install incinerator equip. and accessories, plant, Bostwich Ave., BRIDGEPORT, CONN. City, Hy. Comn., City Hall, Bridgeport, Conn. Bids Nov. 3. CD 10/19.

N. Benvenuti & Sons, 16 Elm St., New Haven, Conn., LB $903,000, est. $812,390, sewage treatment plant addn., alterations, off Colcott St., MANCHESTER, CONN. Town, Richard Martin, genl. mgr., Municipal Bldg., Manchester, Conn. Bids Nov. 8. CD 10/18.

BUILDINGS—LB & CA

J. J. Powers Co., 127 Alewife Brook Parkway, Cambridge, Mass. LB $489,323. BANK, BOSTON, MASS. Merchants Co-operative Bank, 24 School St., Boston, Mass. Bids Nov. 8. CD 11/2.

† Reed & Stone, 136 Pearl St., Essex Junction, Vt. LB $225,900, est. $225,000. field maintenance SHOP, Camp Johnson, IFB 43-56-5, WINOOSKI, VT. USA Property & Fiscal Office Bldg. 1, Camp Johnson, Winooski, Vt. Jennison Eng., Inc., 15 Center St., Burlington, Vt., engr.

▲ George A. Fuller Co., 11 Beacon St., Boston, Mass. CA Approx. $1,000,000. SCIENCE BLDG., WALTHAM, MASS. Brandeis University, 415 South St., Waltham, Mass. Bids Oct. 26. CD 10/19.

Donatelli Bldg. Co., Inc., 118 Cottage Ave., North Providence, R. I., LB $604,468, est. $600,000, SHOPPING CENTER, Willard Center Development, PROVIDENCE, R. I. Willard Centre Realty Co., E. Harold Dick, Atty., Hospital Trust Bldg., Providence, R. I. Bids Nov. 3. CD 10/19.

Brooklawn Constr. Co., 254 Prospect Ave., West Hartford, Conn., CA $550,000. OFFICE, 855 Asylum Ave., HARTFORD, CONN. John E. Hayes, 855 Asylum Ave., Hartford, Conn. Willard Wilkins, 945 Asylum Ave., Hartford, Conn., archt.

▲ Wadhams & May Co., 15 Lewis St., Hartford, Conn., CA, $2,235,004, est. $2,300,000. Proj. Conn. 54-C-405, AA HIGH SCHOOL, Pond Hill, WALLINGFORD, CONN. Town, School Dpt., Moses Y. Beach School, Wallingford, Conn. Bids Sept. 13. CD 9/20, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

† N. Y., Fort Jay—FERRY SLIPS—BA 11/29—U. S. Eng., 111 E. 16 St., New York, Zone 3, three ferry slips at Fort Jay, Staten Island, ENG-30-075-56-169. $500,000-$750,000. Plans deposit $20. CD 10/18.

† New York—BA 12/1—U. S. Eng., 111 E. 16 St., New York, Zone 3, dredging approx. 124,700 cu. yd. all material except ledge rock from Dutch Kills, Newtown Creek, Queens Co., CIVENG-30-075-56-30.

† New York and New Jersey—BUILDINGS—BA 12/15—U. S. Eng., 111 E. 16 St., New York 3, N. Y., interconnecting corridor and engine generator and frequency changer bldgs. for Special AAA Facilities, Schedule I, sites in New Jersey, south of Plainfield, at Fort Hancock, Crawford Corners, South Amboy and Plainfield; Schedule II, sites in New Jersey and New York west of Hudson River at Morristown, Mountain View and Ramsey, N. J., and Orangeburg, N. Y., Schedule III sites in Long Island and Westchester, at Lido Beach, Long Island, Hicksville, L. I., Fort Slocum, Kensico and Fort Tilden, N. Y., Schedule IV, sites in Buffalo, New York area, Grand Island, Cambria and Lewiston, ENG-30-075-56-190, $500,000-$750,000. Plans deposit $10 each schedule. CD 2/18/55.

† New York—SPECIAL AAA FACILITIES—BA On Or About 12/20—U. S. Eng., 111 E. 16 St., New York, Zone 3, constr. Special AAA Facilities (FY 1955 program) at Brookhaven, ENG-30-075-56-109. $750,000-$1,000,000. Plans deposit $100.

HEAVY CONSTRUCTION—LB & CA

Laurence J. Rice, Inc., 61-40 Maurice Ave., Maspeth, L. I., N. Y. CA $594,000. air cargo bldg. at New York International Airport, IDLEWILD, N. Y. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. CD 10/31, under LB.

† J. J. Haggerty, Inc., Rogers Ave., Westhampton Beach, N. Y. LB $372,791 Schedule 1; $111,563 Schedule 2; $482,354 Schedule 3 (5 bidders). paving POL facilities incl. bit. paving, conc. paving, gasoline pump house, fuel facilities, electrical work, site drainage, fencing, grading, seeding and mulching, Suffolk Air Force Base, ENG-30-075-56-153, WESTHAMPTON, N. Y. U. S. Eng., 111 E. 16 St., New York 3, N. Y. Bids Nov. 10. CD 10/21.

▲ NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton,
Brann & Stewart Co., Suburban Station Bldg., Phila., Pa., CA, $1,350,149, piers, foundations for new Route 72 bridge over Barnegat Bay between Manahawkin and Ship Bottom, Stafford Twp., Ocean Co. Bids Oct. 18, awarded Nov. 4. CD 10/21, under LB.

▲ Cayuga Foundation Corp., 30 Vesey St., New York, N. Y. CA $1,479,000. North Bergen viaduct roadway on New Jersey approaches to Lincoln Tunnel will be widened from 6 to 8 lanes, NEW JERSEY. Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. CD 10/31, under LB.

State Hy. Dpt., 506 N. Office Bldg., Harrisburg, Pa. Own Forces. $425,000. placing 14,100,000 ft., or more than 2.670 mi. snow fence, PENNSYLVANIA.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,
Geo. F. Hazelwood Co., Cumberland, Md. CA $507,564. 3 span steel beam bridge over North Branch State Rte. 51, 214 ft. long, 28 ft. roadway, 0.928 mi., grading, paving approaches Contr. A 466-617, Allegany Co. CD 10/13, under LB.

▲ C. J. Langenfelder & Sons, Inc., 8427 Pulaski Hy., Baltimore, Md. LB $5,532,333. State Roads Contr. PT106, part of Patapsco Tunnel Proj., MARYLAND. State Rds. Comn., 108 E. Lexington St., Baltimore 2, Md. Bids Nov. 10. CD 10/25.

S. J. Bell Constr. Co., 3610 Wheeler Ave., Alexandria, Va. LB $167,593. (6 bidders) Contr. 1443 W, water main, in Allentown and Brinkley Rds. and various other streets in vicinity, Camp Springs, HYATTSVILLE, MD. Washington Suburban Sanitary Comn., Hamilton St., Hyattsville, Md. Bids Nov. 7. CD 11/2.

Lisbon Constr. Co., 11400 Kemp Mill Rd., Silver Spring, Md. LB $101,615. (15 bidders) Contr. 81-D storm drainage, constr. in Flower Ave., Franklin Ave., Long Branch Parkway, Mintwood Rd., Silver Spring, HYATTSVILLE, MD. Washington Suburban Sanitary Comn., Hamilton St., Hyattsville, Md. Bids Nov. 7. CD 11/2.

Washington Suburban Sanitary Comn., Hamilton St., Hyattsville, Md. Own Forces. sewer constr. in Baltimore Ave., Upshur St., 46 St., Contr. 1613-S, HYATTSVILLE, MD. Bids Oct. 17, rejected LB $129,230. CD 10/20, under LB.

BUILDINGS—LB & CA

▲ Caristo Constr. Co., 26 Court St., Brooklyn 2, N. Y. LB $1,560,000. (4 bidders) general contract PUBLIC SCHOOL 58, Smith St. between Carroll St. and First Place, BROOKLYN, N. Y. Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City 1, N. Y. Bids Nov. 9. CD 10/12.

Clover Leaf Homes, c/o Edmund Williamson Co., 1118 Teaneck Rd., Teaneck, N. J. Owner Builds. $670,000. 42 houses on tract on North Middleton Rd., PEARL RIVER, N. Y.

Geo. Schenck, 118 Wagner Ave., Butler, Pa. CA $161,000. 1 story, part bsmnt., 50x80 ft. block two pilot PLANTS, CALLERY, PA. Callery Chemical Co., Callery, Pa. Bids Oct. 18. CD 10/6.

▲ Rust Eng. Co., 575 Sixth Ave., Pittsburgh, Pa. CA Est. $1,000,000. design and construct 2 story, steel, 100,000 sq. ft. furniture mfg. PLANT addn., WEST MIFFLIN, PA. Schwayder Bros., West Mifflin, Pittsburgh, Pa. CD 11/2.

Marios Development, Inc., 4001 Second St., Baltimore, Md. Owner Builds. $395,000. forty-two 2 story, brick HOUSES, 1300 block Tompkins St., 3700 block Everett St., 3900 block Inner Circle, BALTIMORE, MD.

Sinclair Estates, Inc., 1403 Munsey Bldg., Baltimore 2, Md. Owner Builds. $391,000. fifty-seven 2 story, bsmnt., brick, masonry DWELLINGS, 4800 block Greencrest Rd. 5400 block Force Rd., BALTIMORE, MD.

SOUTH

HEAVY CONSTRUCTION—BA

▲ Fla., Tampa—BA 12/1—Bd. Representatives, City Hall, Div. XE18, 53,440 lin. ft. 8, 10 and 12 in. vitr. clay sewers, $403,700; Div. XE19, 41,560 lin. ft. 8- to 12-in. vitr. clay sewers, $306,500; Div. XE20, 26,800 lin. ft. 8 and 12 in vitr. clay sewers, $188,900; Div. XE22, 23,400 lin. ft. 8 in. vitr. clay sewers, $172,500. Plans deposit $25. Greeley & Hansen, 220 S. State St., Chicago 4, Ill. engrs. Bids Nov. 3 rejected LB $518,244, Div. XE18, LB $386,343, Div. XE19, LB $242,159, Div. XE20, LB $196,079, Div. XE22. CD 11/9 under LB.

▲† Alabama—BA 12/2—U. S. Eng., Grant St., Mobile, deepening Mobile Harbor channels, approx. 3,900,000 cu. yds fill removed in maintenance work and approx. 32,600,000 cu. yds fill removed in new work.

BUILDINGS—BA

S. C., Columbia—HIGH SCHOOL—BA 11/29—Bd. Trustees, Richland County Schools, Court House, Columbia, Junior High School. $675,000. Plans deposit $50. Lyles, Bissett, Carlisle & Wolff, 1320 Bull St., engrs.-archts.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $44,000; other public works $73,000; industrial buildings $93,000; other buildings $344,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction
(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England — **Middle West**
Middle Atlantic — **West of Mississippi**
South — **Far West**

PROPOSED WORK
Water Supply — **Public Buildings**
Sewers, Waste Disposal — **Mass Housing**
Bridges — **Commercial Buildings**
Streets & Roads — **Industrial Buildings**
Earthwork, Waterways — **Unclassified**

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, REPORTS, ENGINEERING NEWS-RECORD, 330 W. 42 St., New York 36, N. Y.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

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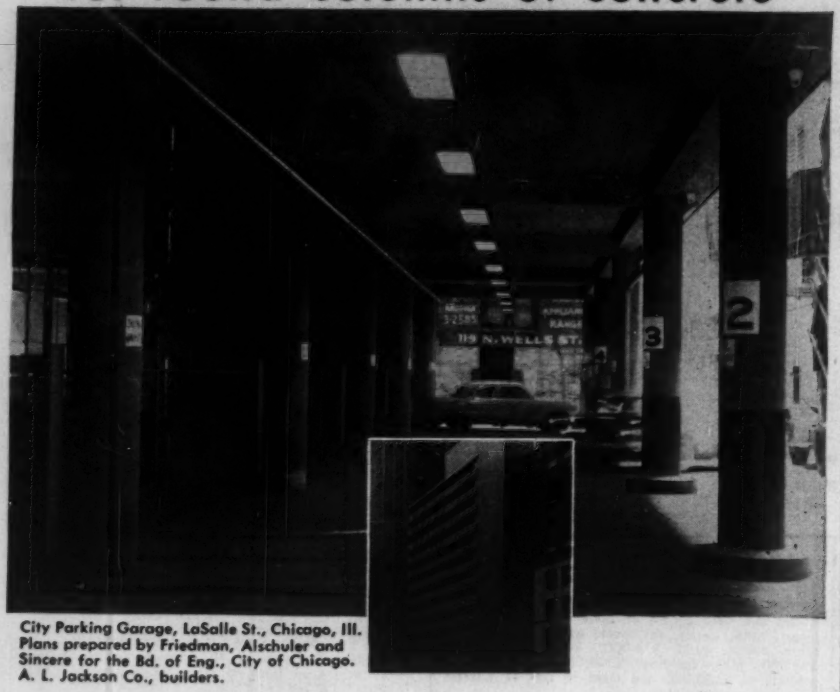

City Parking Garage, LaSalle St., Chicago, Ill. Plans prepared by Friedman, Alschuler and Sincere for the Bd. of Eng., City of Chicago. A. L. Jackson Co., builders.

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HEAVY CONSTRUCTION—LB & CA

† **Boyle Constr. Co.**, 30 E. Liberty St., P. O. Box 471, Sumter, S. C., LB **$144,654**, N.C.O. club, Myrtle Beach Air Force Base, No. 38-081-56-15, MYRTLE BEACH, S. C. U. S. Eng., Customhouse, Charleston, S. C. Bids Nov. 4. CD 10/11.

† **Empire Gas Eng. Co.**, 7 Baltimore Pl. N.W., Atlanta, Ga., LB **$625,445**, base facilities, No. 08-123-56-21, Homestead Air Force Base, HOMESTEAD, FLA. U. S. Eng., Box 4970, Jacksonville, Fla. Bids Nov. 4. CD 9/28.

▲ **Bumby & Stimpson**, 525 Hames St., Orlando, Fla., CA **$1,095,065**, Div. XE17, 62,700 lin. ft. 8 in. vitr. clay sewers; Div. XE21, 66,780 lin. ft. 8- to 21-in vitr. clay sewers, TAMPA, FLA. Bd. Representatives, City Hall, Tampa, Fla. Bids Nov. 3. CD 11/9, under LB.

† **W. A. Gray Constr. Co.**, 861 Grimmet Dr., Shreveport, La. LB **$174,903**. engine build-up shop, Greenville Air Force Base, ENG-01-076-56-7, GREENVILLE, MISS. U. S. Eng., 2301 Grant St., Mobile, Ala. Bids Oct. 25. CD 10/10.

KENTUCKY—Commonwealth of Ky., Dpt. Hys., Frankfort,
rejected bids Oct. 14, b. conc. Class I surf. 0.69 mi. South Williamson-Nolan, W. Va. Rd., US 529 (3), SP 98-43 and S 529 (2), SP 98-43, Pike Co. CD 10/24, under LB.

Robert Simmons Constr. Co., 840 Barrett Ave., Louisville, Ky. LB **$262,000**. install horse and mule stalls area K.L.M. new Kentucky State Fair and Exposition Center, LOUISVILLE, KY. State, Div. Purchases, Frankfort, Ky. Bids Nov. 3. CD 10/28.

BUILDINGS—LB & CA

▲ **Kahn Constr. Co.**, 1113 Blossom St., Columbia, S. C. CA **$3,000,000**. HOUSING DEVELOPMENT at Shaw Air Base for Air Force, SUMTER, S. C. Cooper Land Co., c/o Lyles, Bissett, Carlisle & Wolff, archts.-engrs. 1320 Bull St., Columbia, S. C.

▲ **Ebasco Services, Inc.**, 2 Rector St., New York, N. Y. CA Est. **$27,000,000**. design and construct pulp and paper PLANT, BREWTON, ALA. Container Corp. of America, 38 S. Dearborn St., Chicago, Ill. CD 11/11.

▲ **Hogan Brothers, Inc.**, 236 Focis St., New Orleans, La. CA Est. **$1,500,000**. SHOPPING CENTER, on 12 acre tract on U.S. Rte. 90, NEW ORLEANS, LA. Tishman Realty & Constr. Co., 460 Park Ave., New York 22, N. Y. George A. Saunders, 909 S. Jefferson Dr. Parkway, New Orleans, La., archt.

Foster & Creighton Co., American Natl. Bank Bldg., Nashville, Tenn., CA **$690,249**, 2 story Tudor Gothic design LIBRARY and HEADQUARTERS BLDG., NASHVILLE, TENN. Disciples of Christ Historical Society, 419 21 Ave. S., Nashville, Tenn. Crumpton & Hoffman, Century Bldg., Pittsburgh, Pa., engrs. Awarded Nov. 7. CD 3/3.

MIDDLE WEST

BUILDINGS—BA

Mich., Inkster—SCHOOL—BA 11/29—Bd. Educ. School Dist. 7, Nankin Twp., 3200 Middlebelt Rd., Carter Woodson Elementary School addn., Fox St. Plans deposit $25, refundable. Jahr-Anderson Assoc., Inc., 15011 Michigan Ave., Dearborn, archt.

Ind., Elwood—SCHOOL—BA 12/8—School City of Elwood, Keith Scott, supt., Elwood, school on southside. $450,000. Everett I. Brown, Circle Tower, Indianapolis, archt. CD 4/3/53.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., Columbus, Zone 15,
O.—**Launder & Sons, Inc.**, Sta. E. Box 6, Toledo, O. LB **$1,025,928**, est. $1,161,600. (7 bidders) Type T-71 and structures 3.333 mi., SR 53-7.67, F-584 (2), city of Fremont, Sandusky Co.;
O.—**C. F. Replogle Co.**, N. Court St., Box 308, Circleville, O. LB **$1,689,558**, est. $2,054,900. (10 bidders) Type T-71 and structures 5.074 mi., USR 22-(3.270-6.43), Muskingum Co.;
O.—**Hinton Constr. Co.**, Celina, O. LB **$202,533**, est. $231,600. (4 bidders) Type T-35, and structures 1.079 mi., SR 119-0.00, S-1182 (1), village of Fort Recovery, Mercer Co.;
O.—**W. P. McCarren Co.**, Walhonding, O. LB **$78,319**, est. $79,200. (2 bidders) Type T-35 0.401 mi., SR 271-22.20 city of Coshocton, Coshocton Co.;
O.—**Schoen Asphalt Paving, Inc.**, 310 S. Westwood Ave., Toledo, O. LB **$536,218**, est. $543,800. (2 bidders) Type T-35 2.046 mi., USR 23B-(12.20-14.20) Lucas Co., Bids Nov. 8;
O.—received no bids Nov. 8. Type T-32 on B-119, 0.197 mi., USR 224-(18.90-22.47), Van Wert Co. CD 10/19.

ILLINOIS—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield,
rejected bids Nov. 1, grade separation and structures, concrete slab bridge, US 51 in Rockford, Winnebago Co. LB **$274,609**. CD 11/7, under LB.

▲ **ILLINOIS**—Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldg., Springfield,
rejected bids Nov. 1, 0.5 mi. P.C.C. pave on Ill. 140 and paved ramps to U. S. 66 for highway grade separation Ill. 140 and US 66, Madison Co., LB **$362,240**; 0.5 mi. P.C.C. pave on Ill. 143 and paved ramps to US 66 for highway grade separation of Ill. 143 and US 66, Madison Co., LB **$367,436**; 0.48 mi. c. conc. pavement US 66, Madison Co., LB **$322,640**. CD 11/7, under LB.

Tomaro Contractors, Inc., 2727 E. Layton Ave., Cudahy, Wis., LB **$206,912** (3 bidders) intercepting sewer, S. Howell Ave., MILWAUKEE, WIS. Sewerage Comn.

of City of Milwaukee, Jones Island, Milwaukee, Wis. Bids Nov. 7. CD 10/21.

▲† **Jaress Constr. Co.**, 300 Spaulding St., Battle Creek, Mich. LB $1,162,440. housing, Kinross Air Force Base, KINROSS, MICH. U. S. Eng., Cadillac Tower, Detroit, Mich. Bids Oct. 27. CD 10/6.

Otto Taylor Eng. Co., 613 N. Woodbridge St., Saginaw, Mich. CA $317,091 (8 bidders) trunk relief sewers C-571, SAGINAW, MICH. City, R. A. Benway, purch. officer, Saginaw, Mich. Bids Oct. 25. CD 10/14.

BUILDINGS—LB & CA

Blenheim Homes, Inc., 760 Oakland Park Ave., Columbus, O. Owner Builds. $400,000. 32 frame HOMES, in 3300 and 3400 blocks Dresden St., COLUMBUS, O.

Marion Contg. Co., Marion, O. LB $377,060. general contract DORMITORY, DELAWARE, O. Ohio Wesleyan University, Delaware, O. CD 11/10, under LB.

▲ **Leo Michuda & Son**, 514 E. 95 St., Chicago, Ill., LB, $5,789,319, HIGH SCHOOL, GYMNASIUM, BOILER ROOM, and SEWERS, 22 St. and Harlem Ave., BERWYN, ILL. Morton High School Assoc., 2423 S. Austin Blvd., Cicero, Ill. A. J. Zelenka, 2331 S. Lombard St., Berwyn, Ill. archt.

Campbell Lowrie Lautermilch Co., 400 W. Madison St., Chicago 6, Ill., CA, $850,000. WAREHOUSE, CHICAGO, ILL. Calumet Industrial District, 1501 E. 96 St., Chicago, Ill. Lunstrom & Skubic, 53 W. Jackson St., Chicago 4, Ill., archts. Awarded Nov. 1.

▲ **MacDougall Builders, Inc.**, 193 W. First St., Elmhurst, Ill., Own Forces, $1,260,000. 60 HOMES, EIMHURST, ILL. Perkins, Norris, Mulloy & Allegretti, 443 Duane St., Glen Ellyn, Ill., archts.

Johnson & Henrickson, 422 Dodge St., Racine, Wis., CA, Total est. $600,000. general contract 1 story 28,000 sq. ft. ENGINEERING BLDG., ROCKFORD, ILL. Twin Disc Clutch Co., 1328 Racine St., Racine, Wis. R. J. Hoffman, 201 6 St., Racine, Wis., archt. CD 10/21;
Broquist & Johnson, 1026 Charles St., Rockford, Ill., CA, plumbing work (Rockford, Ill.);
American Automatic Fire Protection Co., 9 S. Clinton St., Chicago, Ill., CA sprinkler sys. (Rockford, Ill.).

Power Constr. Co., 125 S. Marion St., Oak Park, Ill., LB, $491,862, PUBLIC LIBRARY, WINNETKA, ILL. Village, Village Hall, Winnetka, Ill. CD 6/9.

WEST OF MISSISSIPPI

HEAVY CONSTRUCTION—BA

▲† **N. D., Grand Forks**—PAVING and JET FUEL STORAGE—Bids in December 1955—U. S. Eng., 1709 Jackson St., Omaha 2, Neb.,- constr. aircraft paving and jet fuel storage facilities, Grand Forks Air Force Base, ENG-25-066-56-38. CD 4/14.

▲ **Tex., Corpus Christi**—BA 12/7—Nueces Co., and Nueces County Navigation Dist. and City of Corpus Christi, Corpus Christi, substructure and fenders for Ship Channel Life Bridge at Savage Lane. $1,175,000.

Minn., International Falls—BA 12/19—City, R. Vonder Haar, pres. City Council, storm drainage, sys., sewage treatment plant, $750,000. R. J. Ellison, 2066 Bayard Ave., St. Paul, engr. CD 8/4.

† **Ark., Jacksonville**—OFFICERS CLUB—BA 12/20—U. S. Eng., P.O. Box 867, Little Rock, P 318 officers' club, FY55. $100,000-$500,000. CD 10/17.

† **Ark., Jacksonville**—STORAGE FLY AWAY KIT—BA 12/20—U. S. Eng., P.O. Box 867, Little Rock, N 414 storage fly away kit FY 56, Little Rock Air Force Base. $100,000-$500,000.

Tex., Weatherford—BA 12/20—City, c/o Alvah Allen, mayor and City Comn., City Hall, Contr. 1, constr. Clear Fork Dam; Contr. 2, constr. raw water supply main; Contr. 3, constr. lake intake and pump station. $800,000. Plans deposit $15 each. Contr. No. 1, from Freese & Nichols, 407 Danciger Bldg., Fort Worth, consult. engrs., Contr. Nos. 2 and 3 from Joe J. Rady & Co., 511 Insurance Bldg., Fort Worth, consult. engrs. CD 7/6.

† **Arkansas**—BA 1/3—U. S. Eng., 300 Broadway, Little Rock, revetment and dikes, Willow Bend, Arkansas River. $100,000-$500,000.

† **Ark., Pine Bluff**—BOMBING MAT—BA 1/5—U. S. Eng., P. O. Box 867, Little Rock, PR-206 bombing mat ext. FY 56, Pine Bluff Arsenal. $500,000-$1,000,000.

† **Ark., Blytheville**—PARKING etc.—BA 1/12—U. S. Eng., P. O. Box 867, Little Rock, J 040 parking areas FY 54; A 312 hardstand calib FY 55. $100,000-$500,000. CD 10/11.

HEAVY CONSTRUCTION—LB & CA

▲ **MISSOURI**—State Hy. Dpt., Jefferson City,
Stupp Bros. Bridge & Iron Co., 3800 Weber Rd., St. Louis, Mo. CA $1,916,334. superstructure of two approaches; CA $2,057,958. superstructure work on main spans incl. electric lighting, Missouri River Bridge, St. Louis and St. Charles Counties. CD 11/7, under LB.

† **Bushman Constr. Co.**, 5 and Felix Sts., St. Joseph, Mo. CA $926,070, est. $934,203. earthwork and structures for Cortland Canal, Sta. 2003 plus 90.2 to 2472 plus 48 and wasteway laterals and drains, Bostwick Division, Missouri River Basin Proj., Spec. DC 4501, KANSAS. Bureau Reclamation, Dpt. Interior, Superior, Neb. Bid Oct. 6; awarded Nov. 7. CD 10/19, under LB.

▲ **OKLAHOMA**—State Hy. Dpt., Capitol, Oklahoma City, Zone 5,
Okla.—Anderson Constr. Co., McAlester, Okla., CA $127,-104, est. $135,502 (5 bidders) grade, drain 6.983 mi. Hy. 93, north of Hugo, Choctaw Co.;

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Waugh Memorial Bridge, Houston, Tex. Owned by City of Houston. Francis Niven, Engineer; Constructors, Inc., Contractors. Photo by Woodallen.

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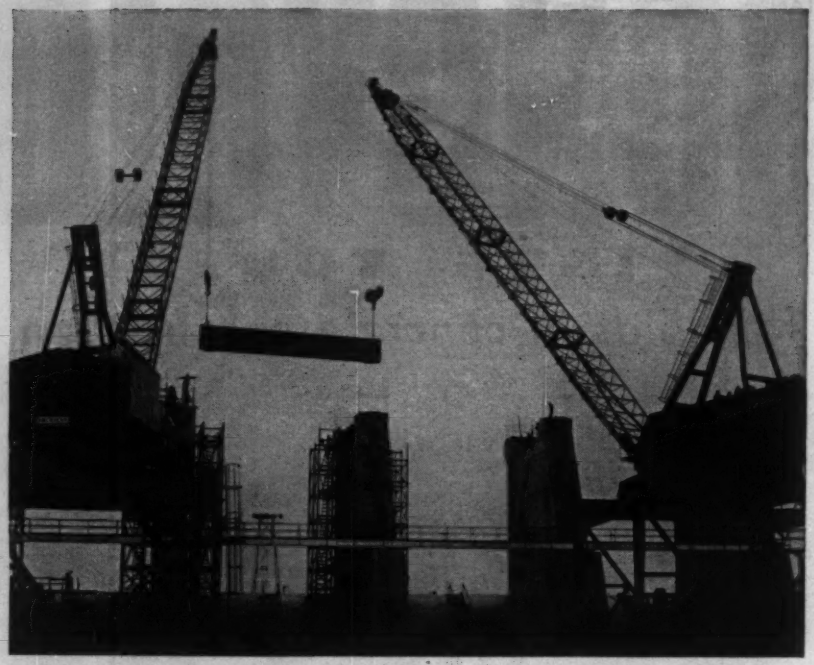

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Unique Vibrator Mounting Enables Spillway Contractor to Vibrate Portion of Girder Impossible to Reach Internally

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• **The huge concrete slab** of the spillway chute was used as a casting bed for precasting and prestressing by the contractors on the project, Johnson, Drake & Piper, Inc.; C. F. Lytle Company; Foley Brothers, Inc.; Winston Brothers Company, and Donovan Construction Company. Among the many members cast on the job, were 64 girders, 47.33 feet long and 6 feet high. Viber Model PX high speed pneumatic external vibrators were used underneath on the first ten to twelve inches of concrete. It was impossible to reach this concrete with internal vibration due to the seven cables that fill the seven inch web.

• **A novel rig** for mounting external vibrators was so portable that the contractor was able to place this concrete with two VIBER Model PX external vibrators. As concrete was placed, the jack and vibrators were rolled under the girder form between timber supports. Raising the jack forced the vibrator to bear against the form, vibrating the mix. Through use of this rig, the vibrator could be quickly shifted to another position against the form or rolled to the next pour.

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A WORKMAN opens the valve to start a VIBER pneumatic vibrator held against the lower flange of a girder form by a Blackhawk floor jack. This external rig can be quickly moved to another location.

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Okla.—**Clark Constr. Co.**, Woodward, Okla., CA $78,783, est. $92,157 (7 bidders) grade, drain 5.796 mi. US 66 east of Erick, Beckham Co.;

Okla.—**Layman & Sons**, Riverside Dr. Tulsa, Okla., CA $1,196,582, est. $1,201,267 (5 bidders), stabil. aggregate base, b. conc. surf. 2.715 mi. US 66 bypass at Tulsa, Tulsa Co.;

Okla.—**Standard Paving Co.**, 2119 E. 11 St., Tulsa, Okla. CA $150,387, est. $162,165 (9 bidders), stabil. aggregate base, double bit. surf. 6.665 mi. Hy. 10, Ottawa Co.; CA $165,031, est. $179,111 (9 bidders) stabil. aggregate base with double bit. surf. 6.74 mi. Hy. 10, Ottawa Co.; CA $104,675, est. $113,570 (9 bidders) stabil. aggregate base, double bit. surf. 4.715 mi. Hy. 10, Ottawa Co.;

Okla.—**W. E. Steelman**, 2800 N. E. 4 St., Oklahoma City 4, Okla., CA $424,535, est. $440,211, (7 bidders) c. conc. 1.542 mi. Hy. 3 in Ada, Pontotoc Co.; CA $174,897, est. $175,100, (7 bidders) b. conc. wid'n. and resurf. 7.615 mi. US 62, west of Harrah, Oklahoma Co.; CA $151,904, est. $152,627 (6 bidders) b. conc. wid'n. and resurf. 6.398 mi. US 62, east of Chocataw, Oklahoma Co. Grand total $2,573,898. Bids Nov. 8, awarded Nov. 9. CD 10/28.

Holland Page, Box 1181, Austin, Tex., LB $937,086, water distr. sys., AUSTIN, TEX. Travis-Williamson Co. Water Control & Imprvt. Dist. No. 1, Court House, Austin, Tex. Cameron Eng. Co., Maltby Bldg., Brownsville, Tex., engr. Bids Nov. 4.

▲ **COLORADO**—State Hy. Dpt., 4201 E. Arkansas St., Denver,

Dominic Leone Constr. Co., Trinidad, Colo., CA $1,026,762, est. $1,038,000. grading, minor structures 12.726 mi. Colo. Proj. FI 002-2 (32), El Paso Co. Bids Nov. 8, awarded Nov. 9. CD 11/14, under LB.

COLORADO—State Hy. Dpt., 4201 E. Arkansas St., Denver,

Colorado Constructors Inc., 725 W. 39 Ave. Denver, Colo., CA $495,038, est. $482,000. asph. surf. 26.951 mi. Toponas, Colo. Proj. S 0134 (6), Grand and Routt Counties. Bids Nov. 4, awarded Nov. 5. CD 10/27.

BUILDINGS—LB & CA

▲ **Rorick Constr. Co.**, 905 S. 20 St., Omaha, Neb., LB $1,027,685, general constr. West Side SCHOOL (Indian Hills School), OMAHA, NEB. Bd. Educ., 3902 Davenport St., Omaha, Neb. Bids Nov. 9. CD 11/2.

▲ **Southwestern Engineering & Constr. Co.**, 2650 Cherry St., Long Beach, Calif., CA $5,000,000. 5,000 bbl. per day platformer and 3,000 bbl. per day unifiner at REFINERY, COFFEYVILLE, KAN. Co-operative Refinery Assn., Coffeyville, Kan.

Carpenter Brothers, 1335 Plowman St., Dallas, Tex. LB $492,000, est. $400,000. LIBRARY, BONHAM, TEX. Sam Rayburn Library, Sam Rayburn Foundation, Bonham, Tex. Bids Nov. 4. CD 10/28.

J. E. Morgan & Sons, Box 6029, Dallas, Tex., CA $500,000. OFFICE-WAREHOUSE, DALLAS, TEX. Carrier Corp., North Central Expressway, Dallas, Tex. CD 11/10.

Miles Strickland, 2802 Louisiana St., Houston, Tex. Day Labor. $450,000. 50 DWELLINGS, HOUSTON, TEX. CD 10/19.

▲ **Kennedy-Van Saun Mfg. & Eng. Co.**, 2 Park Ave., New York, N. Y., CA $1,300,000, PLANT MACHINERY, ORANGE, TEX. Texas Portland Cement Co., Orange, Tex. CD 9/2.

▲ **J. M. Odom**, Box 774, Austin, Tex., CA $1,176,516, Dunbar Junior HIGH SCHOOL and Northside Junior HIGH SCHOOL, TEMPLE, TEX. Temple Independent School Dist., Temple, Tex. Bids Nov. 2. CD 11/7, under LB.

Gallatin County High School Dist., Bozeman, Mont. cancelled bids to have been opened Nov. 3, high school, BOZEMAN, MONT. $900,000. CD 10/24.

A. A. & E. B. Jones, 1050 S. Jason St., Denver, Colo., CA $664,333, est. $500,000, general constr. 2 story part bsmnt., 53,000 sq. ft. grade SCHOOL, E. Mexico and S. Dahlia Sts., DENVER, COLO. School Dist. No. 1, 414 14th St., Denver, Colo. Bids Oct. 19, awarded Nov. 3. CD 10/26, under LB.

Ralph Tack, 1201 Berkley Ave., and Clement Hausman, 126 E. 4 St., Pueblo, Colo. Own Forces. $516,643. 61 one story brick RESIDENCES, PUEBLO, COLO.

FAR WEST

BUILDINGS—BA

Calif., **Redlands**—HIGH SCHOOL—BA 12/2—Redlands High School Dist., Redlands, Redlands High School addn. $750,000. Harold Gimeno, 1416½ N. Main St., Santa Ana, archt. CD 7/28/54.

BUILDINGS—SLC

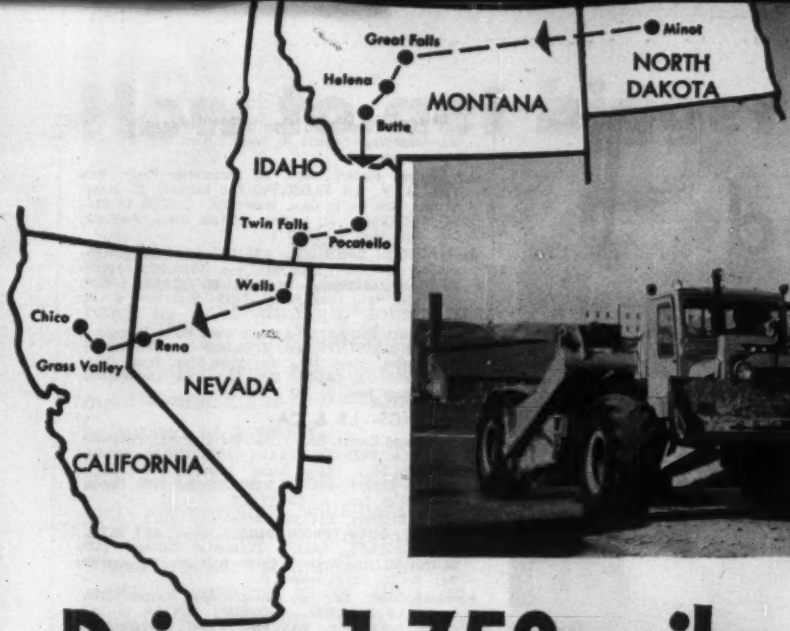
Wash., **Parkland**—DORMITORY—Pacific Lutheran College, Parkland, soon lets contract 3 story, steel frame women's dormitory. $500,000. Lea, Pearson & Richards, 240 Stadium Way, Tacoma, archts. CD 6/3.

HEAVY CONSTRUCTION—LB & CA

Morrison-Knudsen Co., 319 Broadway, Boise, Idaho, CA, $650,000, widening tunnel through Cascade Mountains at east entrance and installing diesel-electric fans, WASHINGTON. Great Northern Ry. Co., R. R. Manion, ch. engr., 175 E. 4 St., St. Paul 1, Minn. International Eng. Co., 74 New Montgomery St., San Francisco, Calif., engrs.

† **M. J. Kuney Co.**, 120 Ralph St., Spokane, Wash., CA $654,000, est. $634,115, five bldgs., providing addnl. storage facilities, Deep Creek Air Force Station, Inv. 56-43, near SPOKANE, WASH. U. S. Eng., 4735 E.

(Continued on page 122)



Drives 1,750 miles . . . total cost $170 total saving $800

What would you do if your dirt-moving equipment was in North Dakota and you had the chance to work in California?

If you had crawlers and scrapers, or big self-propelled scrapers, you'd probably ship them by rail. It would cost you at least $870 per unit one-way, and the trip would take a week or 10 days. Expensive? Yes, but about the only method you could use.

Vernon Testerman, Minot (North Dakota) contractor, had another solution to the problem. His 7-yard D Tournapull, he figured, could easily make the trip under its own power. After all, he had driven the "D" all over North Dakota. The unit's low-pressure tires did no damage to pavement. It was narrow enough and light enough to go anywhere. And it could travel most of the way at 28 mph.

Remembering these advantages, Contractor Testerman checked his machine, loaded fuel drums and other supplies in the scraper bowl, filled up the tank and started off.

Travels 80 hours, averages 22 mph

First check-point for contractor and machine was Great Falls, Montana. From here, the "D" traveled to Helena and Butte, Montana . . . then through Pocatello and Twin Falls, Idaho . . . Wells and Reno, Nevada . . . and Grass Valley, Calif.

On the 8th day, Tournapull arrived in Chico, California. It had traveled 1,750 miles. Total running time, as clocked by the hour-meter, was 80 hours.

"Cost of the trip," writes Testerman, "was exactly $170. That includes fuel, oil, meals, hotel, even cigarettes for the driver, Garry Dibble of Stanley, N.D. It also includes the price of a new water pump. I also had to buy a license in Montana, which cost $11; otherwise I wasn't stopped or asked any questions except by curious people who said I was crazy. They will really think so when I meet them on the road back home to North Dakota."

Or maybe they won't think so, when they realize Testerman saved $700 on the one-way freight bill alone. Or that he also saved about $100 for air or rail transportation for his operator. Plus 1 or 2 days in time. Plus a lot of trouble loading, unloading, etc.

Finishes jobs before others arrive

Chances are, you may never have to make a thousand or two-thousand mile trip with your dirtmoving equipment. However, Tournapull's work-and-run ability cuts non-productive time to a minimum on *any* length move. With Tournapulls, you take the shortest route between jobs, over main highways and through cities, to make the most economical use of manpower and equipment. As Mr. Testerman puts it, "With D Tournapull, you can travel to a small job and have it finished before another type of machine could be loaded and moved. The money you once paid for hauling can be put in your pocket."

Ask us for a demonstration of the LeTourneau-Westinghouse D Tournapull so you can check its mobility and other advantages for yourself. Call to arrange time and place.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-647-G-bwl

On the job, "D" Tournapull usually self-loads. Here it heaps 5 pay yds. of sandy loam in 1 min. Typical 900' cycles take 2⅔ minutes.

Tires provide such good compaction, rollers often are not needed. Nor are small tractor-dozers; "D's" blade does much of their work.

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

Hard-Packed Clay

couldn't stop this McKIERNAN-TERRY PILE HAMMER

11B3 Double-Acting Pile Hammer included in the McKIERNAN-TERRY line of 15 sizes of double-acting and single-acting pile hammers and 2 sizes of double-acting extractors.

To prepare the foundation for the concrete spillway of a new Texas dam, many, many piles were needed . . . 2,127 of them. In addition, the piles had to be driven into resistant, hard-packed clay.

It might have been a tough and lengthy job, but not to the powerful, fast-driving McKiernan-Terry 11B3 Double-Acting Pile Hammer wisely selected by the contractors, Reynolds & Williams and Noonan Construction Co.

WRITE FOR BULLETIN

Contractors all over the world have learned from experiences like this that McKiernan-Terry Hammers can always be depended upon for speedy, economical pile-driving jobs.

McKIERNAN TERRY

McKIERNAN-TERRY CORPORATION, Manufacturing Engineers

Also manufacturers of coal and ore unloaders and bridges, grab buckets and special machinery

80 RICHARDS AVENUE, DOVER, NEW JERSEY

MK360C

Plants: Harrison, N. J. and Dover, N. J.

(Continued from page 120)

Marginal Way, Seattle 4, Wash. Bids Oct. 21. CD 10/26, under LB.

▲† **Ferranti Electric, Inc.**, 30 Rockefeller Plaza, New York, N. Y., LB $2,080,940 (10 bidders) 21 transformers, The Dalles Dam, Wasco Co., CIVENG-35-026-56-34, OREGON. U. S. Eng., Pittock Block, Portland, Ore. Bids Nov. 1. CD 9/1.

Bovee & Crail Constr. Co., 15134 Indiana Ave., Paramount, Calif., LB $406,483, est. $400,000 (3 bidders) gas compressor station, LONG BEACH, CALIF. City, City Hall, Long Beach, Calif. Bids Nov. 9. CD 11/1.

Matt J. Zaich Co., 6828 Farmdale Ave., North Hollywood, Calif., LB $597,727, est. $750,000 (9 bidders) sanitary sewers, Sharp Ave., Van Nuys Blvd. Sewer Dist., LOS ANGELES, CALIF. City, City Hall, Los Angeles, Calif. Bids Nov. 9. CD 10/21.

BUILDINGS—LB & CA

W. R. Cahoon Constr. Co., 3208 Pole Line Rd., Pocatello, Idaho, LB $425,000. TRADE, INDUSTRIAL EDUCATION BLDG., Idaho State College, POCATELLO, IDAHO. State Comr. P. Wks., Capitol Bldg., Boise, Idaho. Bids Nov. 3. CD 10/19.

▲ **Steed Brothers**, Box 350, Alhambra, Calif., CA $1,318,400, DORMITORIES, DINING HALL, ART BLDG., LOS ANGELES, CALIF. Occidental College, 1600 Campus Rd., Los Angeles, Calif. Bids Oct. 28, awarded Nov. 4. CD 11/4, under LB.

Plymouth Constr. Co., 160 Castro Village, Castro Valley, Calif., LB $500,000. SHOPPING CENTER to incl. offices, stores, etc., OAKLAND, CALIF. Crescent Investment Co., 727 Shasta St., Redwood City, Calif. N. T. Nahas, 160 Castro Village, Castro Valley, Calif., archt.

▲ **Continental Constr. Co.**, P.O. Box 2551, Sacramento, Calif., CA $1,500,000. 2 story Bishop Armstrong HIGH SCHOOL, 2 story RECTORY, SACRAMENTO, CALIF. Archbishop of Sacramento, c/o Harry H. Devine, archt., 1012 "J" St., Sacramento, Calif.

▲ **Austin Co.**, 618 Grand Ave., Oakland, Calif., CA $6,000,000. five OFFICE BLDGS. and underground parking for approx. 500 cars, SAN MATEO, CALIF. Fifth Ave. Corp. of Calif., 335 Hayes St., San Francisco, Calif. John Gloe, 362 Clay St., San Francisco, Calif., archt.

CANADA

HEAVY CONSTRUCTION—BA

▲ **N. B., Moncton** — HOUSING — BA 11/29 — Central Mortgage & Housing Corp., 1032 Gottingen St., Halifax, N. S., 110 housing units (96 bldgs.) Air Force Station. $1,5000,000. Plans deposit $100. C. F. Emms, c/o owner, asst. reginal constr. engr.

BUILDINGS—BA

Ont., Newmarket—HIGH SCHOOL—BA 11/30—Newmarket High School Bd., Newmarket, high school addn., incl. gymnasium, cafeteria, administrative offices. $750,000. Weir, Cripps & Assocs., 1216 Young St., Toronto, archts.

Que., Montreal—HIGH SCHOOL—BA 12/1—Protestant School Comrs. of Lachine, 3460 McTavish St., 3 story, no bsmnt., Y-shaped, structural steel frame, high school, Sherbrooke St. $900,000. Plans deposit $250. Meadowcraft & MacKay, 4115 Sherbrooke St. W., archts. deStein & McCutcheon, 516 Grosvennor Ave., engrs.

▲ **Ont., Sudbury**—FEDERAL—BA 1/11—Dpt. P. Wks., Hunter Bldg., Toronto, federal bldg., Elm, Lisgar and Cedar Sts. $3,000,000. Plans deposit $200. Louis N. Fabbro, 251 Lorne St. S., archt. CD 7/1.

▲ **Ont., Cornwall**—SCHOOL—Bids Asked—Cornwall Collegiate & Vocational School Bd., 46 Second St. W., approx. 61,000 sq. ft. new school addn., with approx. 24,000 sq. ft. alterations to present bldg. $1,160,000. Comber, Comber & Mack, 120 Sydney St., archts. CD 1/27.

HEAVY CONSTRUCTION—LB & CA

▲ **Majestic Contractors, Ltd.**, 408 Royal Trust Bldg., Edmonton, Alta., CA Total est., $3,000,000. pipe line gathering sys. at gas processing plant REDWATER, ALTA. Imperial Oil Ltd., 102 St. and 100 Ave., Edmonton, Alta. Awarded Nov. 1.

BRITISH COLUMBIA—B. C. Govt., Parliament Bldgs., Victoria,

B. C.—Western Bridge & Steel Fabricators, Ltd., 145 W. 1st Ave., Vancouver, B. C., LB $396,233, structural steelwork, equip and misc. metalwork for new Pitt River Bridge on Lougheed Hy. near Haney;

B. C.—Marpole Constr. Co. Ltd., 8784 Laurel St., Vancouver, B. C., LB $417,871, constr. Pitt River Bridge on Lougheed Hy. near Haney, Bids Nov. 2. CD 10/20.

▲ **Terminal Constr. Co. Ltd.**, Dominion Square Bldg., Montreal, Que., CA $1,046,640. foundations for recreation bldg. and skating rink, footings for ration depot, rehabilitation and completion of receiver bldg., constr. permanent married quarters and services, at Air Base, GOOSE BAY, LABRADOR. Defence Construction (1955) Ltd., 56 Lyon St., Ottawa, Ont. Awarded Nov. 1.

ONTARIO—Dpt. Hys., Parliament Bldgs., Toronto, **Storms Contg. Co., Ltd.**, 1 Copeland St., Toronto, Ont., LB $660,379 (5 bidders) grading, culverts, granular base 7.94 mi. secondary road from Depot Lake northerly, Contr. 55-147, Blind River. Bids Nov. 16. CD 10/27.

BUILDINGS—LB & CA

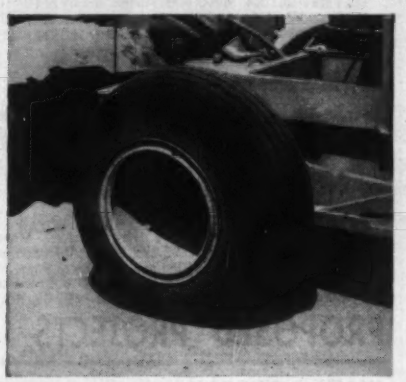
▲ **Brown & Root, Ltd.**, 528 9th Ave. W., Calgary, Alta., CA Total Est. $3,000,000, gas processing PLANT to process 10,000,000 cu. ft. field gas daily

(Continued on page 124)

How to get bigger loads in sand

Sand is loose, shifting, highly-abrasive . . . difficult to load, hard to haul through, tough to spread . . . slow and costly to handle. But with the right equipment — and know-how — sand can be moved at a profit.

Use wide-base sand tires. Special low-pressure, wide-base tires are available for working in sand. These tires have tough, flexible sidewalls. They are wider than ordinary earthmoving tires. They spread out over a larger area to give better flotation. Their shallow, rounded tread does not dig in.



These tires are designed to operate with extremely low pressures. For example, a D Tournapull, equipped with 65" sand tires, works at pressures of 10 to 20 pounds in dry sand, and 15 to 20 pounds in moist sand.

Sand has a tendency to run ahead of the scraper blade and apron. The rounder, finer, and drier the particles, the worse this condition becomes. When loading sand, follow this method for best results:

Go into the loading area fast, lowering the blade slowly and picking up as much sand as possible by using the momentum of the machine. This will fill the hard-to-reach rear area of the bowl, and is especially effective for rubber-tired prime-movers loading in second or third gear.

Rolling resistance in soft, loose sand is higher than in any other material. Wide-base drive tires provide plenty of flotation.

Then shift into lower gear to match pusher-tractor speed (if one is being used), and pump the bowl up and down. For best results in pumping, drop the blade as scraper wheels roll into the depression made by the previous pump, and raise the blade as the wheels are climbing out of it. *To top out the load,* drop bowl deeply two or three times as you near end of the loading area.

Get what you can and run. Where hauls are 200 ft. or less, don't waste time trying to get the extra half-yard. Many times that extra half-yard means an extra 30 seconds in the cut. In the same half-minute, your scraper could travel 500 ft. On very long hauls, however, where load time represents a much smaller fraction of the cycle, it *may* pay to try for that extra half-yard or yard. Where the balance point is close, it's a good idea to time your cycles and estimate your pay load carefully.

Spread on the run. Sand flows freely and can be spread at high speed in thin layers. High-speed spreading also takes advantage of momentum of the hauler to keep the machine from digging in and bogging down on loose fills.

Spread "on the run." This prevents sand from piling up in front of scraper, speeds distribution of load.

For free copies of this article, write LeTourneau-Westinghouse Company, Peoria, Illinois. Please state quantity desired.

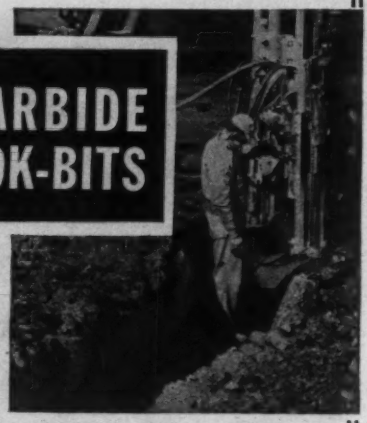
Tournapull—Trademark Reg. U.S. Pat. Off. G-741-OP-bw

LeTourneau-WESTINGHOUSE Company

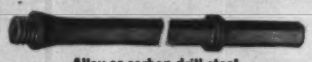
Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

➡ SAVE HOURS
➡ CUT COSTS
drilling trench rock with CARBIDE ROK-BITS



There's a 50%, or more, increase in blast hole drilling footage with carbide Rok-Bits®. Other Rok-Bit cost-cutting advantages: straight, full gauge holes —better chip clearance, so bit is not working in its own cuttings—less air consumed—drilling ahead of schedule, profits secure. Get the Rok-Bit facts, from nearest B & L plant, before you buy another bit.



Alloy or carbon drill steel

Carbide Rok-Bits—cross or chisel types—gauge sizes: 1¼" thru 4½"

Intra-Set Drill Steel—carbide insert—gauge sizes: 1⅛-thru 2¼-in.

Brunner & Lay Products

Brunner & Lay, Inc.
9300 King St.
Franklin Park, Ill.

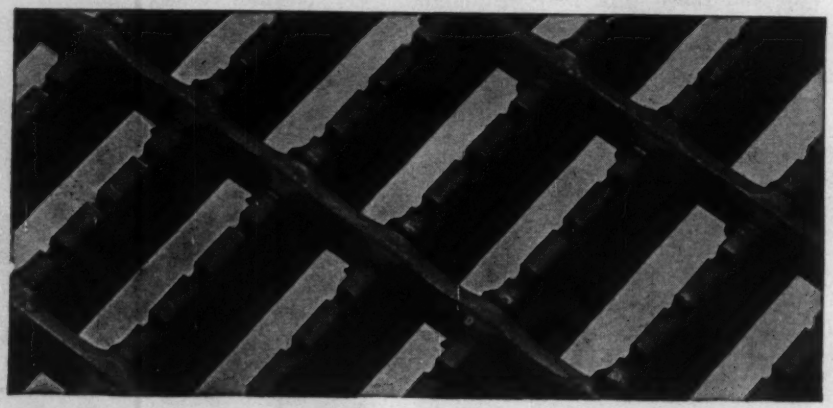
Brunner & Lay Rock Bit of Philadelphia, Inc.
2514 East Cumberland St.
Philadelphia 25, Pa.

Brunner & Lay of Los Angeles, Inc.
2425 East 37th St.
Los Angeles 58, Calif.

Brunner & Lay, Inc.
150 Leslie St., Dallas, Texas

Brunner & Lay Rock Bit of Asheville, Inc.
Sweeten Creek Rd., Asheville, N.C.

Brunner & Lay Corp.
660 N. Tillamook St., Portland 12, Ore.



New Slip-Proof Design makes

Gary SERRATED GRATING safest

WHERE GOOD TRACTION IS IMPORTANT

Indoors or out, for area gratings in sidewalks, inclined walkways, fire escapes—wherever safe-footing is important, this one-piece, resistance-welded grating will provide safer working conditions. It's tailor-made to your requirements. Write for descriptive Catalog E-115.

FREE SAMPLE
We'll send this handy paper weight if you request it on your company stationery.

Standard Steel Spring Division
ROCKWELL SPRING AND AXLE CO.
4004 East Seventh Avenue • Gary, Indiana

(Continued from page 122)

with manufactured products being butane, propane and pentanes, near REDWATER, ALTA. Imperial Oil Ltd., 102 St. and 100 Ave., Edmonton, Alta. Awarded Nov. 1.

G. H. Wheaton, Ltd., Kitimat, B. C., CA $770,000, 2 story, concrete COMMERCIAL BLDG., KITIMAT, B. C. Aluminum Co. of Canada, Ltd., Kitimat, B. C. Bids Sept. 7, awarded Nov. 5. CD 9/7.

Klassen & Born, 1592 E. 57 Ave., Vancouver, B. C., CA $449,469, JUNIOR HIGH SCHOOL, SARDIS, B. C. School Dist. 33, Chilliwack, B. C. Anderson & Raymer, Chilliwack, B. C., archts. Awarded Nov. 4.

Palait & Lebovic Constr. Ltd., 16 Strathearn Rd., Toronto, Ont. Owner Builds. $504,000, 8 story steel or rein.-con. APARTMENT, Tyndall Ave., TORONTO, ONT. Max R. Goldman, 3130 Bathurst St., Toronto, Ont., archt. Alex Tobias, 24 Cecil St., Toronto, Ont., engr. CD 7/6/54.

▲ John Caron Builders Regd., 48 Ave., Lachine, Que. Owner Builds. $4,200,000. 300 unit HOUSING DEVELOPMENT north of Metropolitan Blvd., BEACONSFIELD, QUE. Central Mortgage & Housing Corp., 940 Cote De Liesse Rd., Town of Mount Royal, Montreal, Que., engrs.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ Costa Rica—BA 12/15—Bureau P. Rds., Dpt. Commerce, 18th and F Sts. N. W., Wash. 25, D. C. grading, drainage, crushed gravel or stone surf., bit. surf., 28 bridges and other work at San Ramon, Costa Rica Projects 75-56-3A and 75-56-3B of Inter-American Hy. between San Ramon and Nicaragua Border. CD 10/19.

HEAVY CONSTRUCTION—LB & CA

Constructora Mercedes, Domicilio Conocido, Tuxtla Gutierrez, Mexico, CA $500,000. civil airport, TUXTLA GUTIERREZ, MEXICO. Sria de Comunicaciones, Mexico City, Mexico. Awarded Nov. 8. CD 9/16.

AMERICANS ABROAD

HEAVY CONSTRUCTION—BA

▲† Spain — BA 11/23 — Brown-Raymond-Walsh, Prime Contractors, Eng. Dpt., Edificio Espana, Madrid, Spain, POL storage and distr. sys., at Rota, Moron, Torrejon and Zaragoza for Bureau Yards & Docks, Navy Dpt., 18 St. and Constitution Ave. N. W., Wash. 25, D. C.-U. S. Air Bases. Extended date. CD 10/14.

HEAVY CONSTRUCTION—LB & CA

▲† Alexander Constr. Co., 4641 Hiawatha Ave., Minneapolis, Minn., U.S.A. CA $2,179,325 (6 bidders) rehabilitation of airfield, Kindley Air Force Base No. 30-347-56-2, BERMUDA. U. S. Eng., 346 Broadway, New York 13, N. Y. U.S.A. Bids Sept. 19. CD 8/17.

PROPOSED PROJECTS

WATER SUPPLY

▲ Calif., San Francisco—City and San Francisco Co., Public Utilities Comn., City Hall, voted $54,000,000 bonds Nov. 8, 2 power plants and appurtenances, Hetch-Hetchy Dam Project, Tuolumne Co.

▲ Mont., Bozeman—City, increasing city water supply and imprv. distr. sys., increasing pressure throughout city, $1,000,000, Morrison-Maierle, Helena, consult. engrs. Engineering study to be completed in 1956.

▲ New Jersey—State Water Supply Bd., Dpt. Conservation & Economic Development, 1060 Broad St., Newark, defeated $100,000,000 bonds, water supply incl. Chimney Rock Reservoir, Somerset County. $60,000,000. Tippetts-Abbett-McCarthy-Stratton, 62 W. 47 St., New York, N. Y., consult engrs. CD 9/29.

▲ N. C., Lenoir—Town, voted bonds Nov. 1, water, sewer and fire protection facilities. $1,750,000. CD 2/18/47. 2/5/54 under Sewers, Waste disposal.

▲ O., Cleveland—City, Dpt. P. Utilities, Emil J. Crown, dir., City Hall, Zone 14, exten. Lee Rd. water main, $1,000,000; constr. Trebisky-Dorsch water main leading to Highland Park, $1,300,000. Havens & Emerson, 640 Leader Bldg., Cleveland, Zone 14, consult. engrs., Geo. W. Hamlin, Utilities Eng. Div., City Hall, Zone 14, engr. CD 1/27/54.

▲ Okla., Oklahoma City—City Hall, bond election Dec. 13, water distr., water plant extens. $9,000,000; Chickasaw Creek dam and water supply imprvs., $4,976,000. Election date extended. W. W. Baker, city engr. CD 10/28.

▲ Va., Fairfax—Bd. Supervs. Fairfax Co., Court House, defeated bonds Nov. 8, integrated water sys. $30,000,000. CD 10/10.

▲ Va., Lynchburg—City, City Hall, voted bonds Nov. 8, water-sewer imprvt. program. $5,000,000. CD 8/26/54, under Water Supply. CD 9/18/52, under Sewage, Waste Disposal.

▲ Va., Portsmouth—City, City Hall, voted $2,500,000 bonds Nov. 8, water supply. CD 8/18.

SEWERS, WASTE DISPOSAL

▲ Calif., South San Francisco—City, City Hall, bond election in April 1956, sewerage sys. imprvs. $1,000,000.

▲ Colo., Boulder—City, City Hall, voted bonds Nov. 8, sewage treatment plant. $1,100,000. CD 10/19.

(Continued on page 126)

What about hydro-flation?

Water or "hydro-inflation" of farm and industrial tractor tires is an old and accepted practice. In the last few years, it has been tried extensively in self-propelled scrapers and big rubber-tired tractors, too. While all the benefits and possible faults are not yet known for dirtmoving uses, certain obvious advantages make it worth your careful consideration.

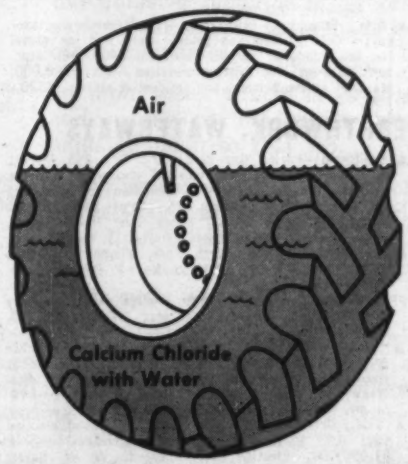
Hydro-flation increases weight of 208 hp, 31,700-lb. Tournatractor by nearly 10%. Increased traction and drawbar pull, plus decreased tire slippage and decreased tire wear are the results.

Measures weight and traction

Biggest advantage is that hydro-flation greatly increases the weight —and the traction—on drive wheels. For example, hydro-flation alone increases the weight of *one* 16-ply 21:00 x 25 tire — 700 to 1,400 lbs.

If you hydro-flate the 4 tires of a LeTourneau-Westinghouse Tournatractor in this way, you add up to 5,600 pounds to its working weight. Even allowing for greater rolling resistance (due to the added weight), your drawbar pull is increased by 3,100 lbs.

Hydro-flating the drive tires of other earthmoving equipment increases drawbar by similar margins. And, because the solution counterbalances as the wheel rotates, you lose practically no power on the haul. Hydro-flation also cuts slippage and tread wear, and reduces need for frequent re-inflation due to pressure loss.



With valve stem in top position, fill tire with solution up to level of valve stem. Tire will then be filled to within approximately 75% of capacity. Complete inflation to manufacturer's recommended pressure with air.

Calcium chloride prevents freeze-up

The liquid usually used for hydro-flation is either plain water or a mixture of calcium chloride and water. Because the calcium chloride readily dissolves, it has the advantage of increasing weight without increasing volume. The calcium solution will not freeze, even in sub-zero temperatures, and it will not injure rubber.

Simple to do

Hydro-flation is simple. First, thoroughly mix the calcium chloride with water. Follow recommendations of the tire manufacturer—usually three to five pounds of the chemical are added to each gallon of water. Next, jack up wheel of machine to remove all weight from tire. Then, rotate tire until valve stem is at top and perpendicular to ground. Remove as much air as possible. Attach nozzle of hydro-flater to valve stem. Remaining air will escape as solution is pumped in.

When solution reaches valve stem level, remove nozzle and inflate tire with air to manufacturer's recommended pressures. On construction equipment, tires should not be filled with liquid above 75% capacity. Valve should be at highest position when checking air pressure.

One word of caution if you use the recommended calcium chloride solution instead of just water . . . be sure to obtain tubes with special rubber-sealed base valves. This type valve will prevent separation of the rubber valve base and the metal. Special corrosion-proof gauge should be used for checking pressure, too. Equipment for the liquid inflation can be obtained from an agricultural implement dealer or any large tire distributor or dealer.

Free copies of this article can be obtained by writing LeTourneau-Westinghouse Company, Peoria, Illinois. Please state quantity desired.

Tournatractor—Trademark Reg. U.S. Pat. Off.

G-740-OP-bw

LeTourneau-WESTINGHOUSE Company
Peoria, Illinois
[illegible] Westinghouse Air Brake Company

For extra heavy service

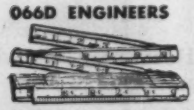
LUFKIN

X-46 RED END
EXTENSION WOOD RULE

066 RED END

Similar to X-46 without brass extension and extra heavy sections. 4, 5, 6 & 8 ft. lengths.

066D ENGINEERS



Marked feet, 10ths and 100ths feet one side, feet, inches, 16ths other side.

Hundreds of thousands of craftsmen the world over prefer the Lufkin X-46 because:

- IT'S EXTRA DURABLE. Has select, straight-grained hard maple sections 50% thicker than standard. Brass strike plates prevent wear.
- IT STAYS ACCURATE. Rust-proof triple-locking joints don't loosen.
- IT STAYS EASY TO READ. Bold markings are embedded right into the wood and protected by a hard plastic finish.

Solid brass extension with block filled figures makes inside measurements easy. 6 foot lengths. Also available with "flat" markings or Folding End Hook.

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. . . . A COMPLETE ASPHALT MIXING PLANT ON WHEELS

IT'S RUGGED, COMPACT, AND DESIGNED FOR SUBSTANTIAL DAILY PRODUCTION AND EASY MAINTENANCE.

HERE'S an outstanding portable asphalt plant that can prove a real money-maker for many of your asphalt mixing jobs. It's a complete plant consisting of dual hot elevator, 2-compartment feed bunker designed for front end loader, rotary dryer, cyclone and exhauster, weigh-box mixer, and skip hoist discharge to hauling trucks. It is rated at 30 tons per hour on a one-minute mixing cycle, but has produced in excess of 40 tons per hour. Get complete details on this outstanding portable plant from your MADSEN Distributor . . . ask for Bulletin LM-1.

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BLH
Construction Equipment Division

(Continued from page 124)

▲ **Mo., Raytown**—City, defeated $1,825,000 bonds Oct. 25, sanitary sewers. B. L. Oliver & Co., 1805 Grand Ave., Kansas City, Mo., consult. engrs. CD 10/5.

▲ **O., Mansfield**—City, City Hall, voted $2,800,000 bonds Nov. 8, sewage treatment plant at site on Hesseldon Rd., trunk line sewer from present plant to new site, Floyd G. Browne & Assoc., Marion, consult. engrs. CD 7/20.

▲ **O., Wickliffe**—City, City Hall, 28730 Ridge Rd., voted $1,600,000 bonds Nov. 8, sewers, Frank A. Thomas & Assoc., 28730 Ridge Rd., consult. engrs. CD 8/19.

▲ **O., Willoughby**—City, combined Willoughby and Eastlake Sewage Disposal Plant, built in Eastlake at mouth of Chagrin River, $1,250,000, Havens & Emerson, 640 Leader Bldg., Cleveland, Zone 14, consult. engrs. CD 9/12/45.

▲ **Okla., Oklahoma City**—City, City Hall, bond election Dec. 13, sanitary sewer extens., $3,000,000; storm sewer extens., $2,900,000. Election date extended. W. W. Baker, city engr. CD 10/28.

▲ **Wis., Manitowoc**—City, City Hall, sewage treatment plant imprvs. $1,000,000. Consoer, Townsend & Assocs., 351 E. Ohio Ave., Chicago, Ill., consult. engrs. Bids in April 1956. CD 10/5/54.

▲ **Wis., Milwaukee**—City, City Hall, sewer constr. program for 1956. $6,000,000. Lloyd D. Knapp, city engr. CD 1/20.

BRIDGES

▲ **Mich., Detroit**—City, Glenn C. Richards, comr. Dpt. P. Wks., City-County Bldg., Zone 26, grade crossing proj. constr. at Livernois south of Lyndon R.R. crossing wid'n. Lyndon between Livernoir and Dexter Sts. $1,820,000; Priority Proj. No. 6, grade separation at Gratiot near French St., $2,500,000. M. F. Wagnitz, city engr. CD 3/30/43.

▲ **O., Cleveland**—Comrs. Cuyahoga Co., Court House, voted $10,000,000 bonds Nov. 8, grade crossing elimination. CD 7/20.

▲ **Okla., Oklahoma City**—City, City Hall, bond election Dec. 13, river bridges, $1,095,000. Election date extended. W. W. Baker, city engr. CD 10/28.

▲ **Alta., Edmonton**—City, Civic Block, ratepayers Oct. 19 approved bylaw, new bridge across North Saskatchewan River. $2,000,000. CD 9/23/52.

STREETS AND ROADS

▲ **NORTH CAROLINA**—State Hy & P. Wks. Comn., Raleigh, **Mecklenburg Co.**—bypass around Charlotte, U. S. Hy. 29, Charlotte, $5,000,000. Bids latter part of December 1955. Wm. H. Rogers, Jr., c/o owner, state hy. engr.

▲ **O., Akron**—City, Leo Walter, Service Dir., voted $20,000,000 bonds Nov. 8, finish North, East, South and West Expressway program, $15,000,000; bridge constr. and general hy. imprvs., incl. Wilbeth-Manchester Rd., elimination bridge, $5,000,000. CD 8/1.

▲ **O., Lorain**—City, City Hall, defeated $4,500,000 bonds Nov. 8, street storm and sanitary sewer imprvs. CD 7/22.

▲ **Okla., Oklahoma City**—City, City Hall, bond election Dec. 13, arterial traffic ways. $4,105,000. Election date extended. W. W. Baker, city engr. CD 10/28.

▲ **Va., Arlington**—Arlington Co. Court House, voted $1,000,000 bonds Nov. 8, sewers; defeated $1,200,000 bonds storm drainage; defeated $1,330,000 bonds for highways. CD 10/14.

▲ **Alta., Edmonton**—City, Civic Block, Edmonton, ratepayers Oct. 19 approved bylaw, asph. surf. on gravel for new roads at various locations $400,000; asph. surf. on gravel and existing gravelled roads, $300,000; standard paving arterial and residential streets, $320,000.

EARTHWORK, WATERWAYS

▲ **California**—Pacific Gas & Electric Co., 245 Market St., San Francisco, has received approval from the California Public Utilities Commission to construct: Kings River Project, Fresno Co., Helms Dam, Wishon Dam, Haas Power House, Kings River Power House, Balch Power House Addn.
Feather River Project, North Fork, Plumas Co., Butt Valley Power House, Caribou No. 2 Power House, Belden Power House.
FPC has approved Feather River Project and preliminary work on Kings River. Total cost is $149,000,000. CD 2/3/48.

▲† **Kansas**—BA 12/8—U. S. Eng., 1800 Federal Office Bldg., Kansas City, Mo., excav. of spillway and constr. embankment Stage III, Tuttle Creek Dam and Reservoir Proj., near Manhattan, Riley Co., Inv. 23-028-56-49. Total est. $7,500,000. CD 10/31.

▲ **Okla., Oklahoma City**—City, City Hall, bond election Dec. 13, North Canadian River floodway imprvs. $1,050,000. Election date extended. W. W. Baker, city engr. CD 10/28.

▲ **Texas**—Canadian Municipal Water Auth., Plainview, voted bonds Nov. 8, constr. Canadian River Dam and facility to provide water service to nine Panhandle, South Plains and West Texas cities to be built near Sanford. $74,800,000. CD 9/21.

AIRPORTS

▲† **Colo., Colorado Springs**—HEADQUARTERS BLDG.—Dpt. Air Force, Air Force Academy, P.O. Box 1670, Colorado Springs, headquarters BLDG. for Continental Air Defense Command, $5,000,000. No appropriation. Colorado Architects-Engineer Associates, (Raymond

(Continued on page 129)

8250 pay yards daily

with 11 C Tournapulls on 2.4-mile cycle

After spreading sand in wet, soft fill, C Tournapull makes turn and starts back on rough 1.2-mile trip to borrow-pit. "C Tournapulls will turn shorter on fill giving them an advantage over others, especially in wet fill," says Supt. J. W. Franks.

"Our judgment was sound when we selected 'C's' for the job," *says Supt. J. W. Franks*

Public Constructors Inc., Pleasantville, New Jersey, are keeping production ahead of schedule, despite tough conditions on the 2¼-million yard contract for the Garden State Parkway in Cape May County. Working continuously in loose, shifty, 100% coarse-to-fine white sand, their 11 C Tournapulls are playing a major role in speeding the job. The "C's" performance is due to:

1. Ability to load, haul, and spread the abrasive material faster and easier than similar units made by other companies.
2. 30 mph speed which saves time and money on the tough, long hauls common to this job.
3. Fewer repairs and 10% more "job availability" through less down-time than other rigs.

2.4-mi. cycle every 10½ min.

Here's a typical C Tournapull work day: Machines are push-loaded in a sand borrow-pit by HD20 crawlers. Loading is difficult because of loose, shifty footing. After loading, the units climb a 3% grade out of pit, make sharp, 90° right turn, and start the 1.2-mile haul to North Lane, or fill area. The 70 to 95′ spread is in wet, soft, sandy fill which makes maneuvering difficult. After spreading material, 180° turn is made for return trip. The 2.4-mile cycle averages about 10½ minutes. Each unit carries 9 loads, averaging 14 pay yds. per load, every 1½ hours. Working 55-minute hour each "C" moves 750 yards per day. The entire fleet of 11 "C's" move 8,250 pay yards daily.

Job 15% ahead of schedule

Considering all the adverse conditions encountered throughout the job, production has still been running 15% over estimates, based on these 11 Tournapulls. Supt. John W. Franks says, "Our earthmoving production records show that our Tournapulls are giving a great performance day-after-day. Our judgment was sound when we selected 'C's' for the job."

Why not try these advantages on *your* next job? Let us compare the "C" by operating it alongside one of your present machines. You'll find it loads faster, hauls faster, and returns faster, especially in tough-to-handle materials. Write or phone for a demonstration today. There's no obligation.

Will scrapers uncover buried pirate treasure?

Where Captain William Kidd, famed British buccaneer who was hanged for piracy in 1701, buried his ill-gotten gains—or if he buried them at all—has long been a mystery. Legend has it that some of his loot is buried in eastern New Jersey, along the route of the Garden State Parkway, near the work-site shown above. One Monmouth County property owner believed in this so strongly that when he sold some land to the N. J. State Highway Authority recently, he insisted upon reserving a claim to any such riches that might be uncovered during construction. But, so far—and the parkway is nearly completed—no buried treasure of any kind has been found on this property—or any other.

(Taken from Better Roads, April, 1955 issue)

Tournapull—Trademark Reg. U.S. Pat. Off.
P-836-H-b

NOW . . . a size Tournapull TO FIT YOUR NEEDS

Model B . . . 23 yds. heaped **Model C . . . 16 yds. heaped** **Model D . . . 7 yds. heaped**

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

ONE OF A SERIES OF IDEAS FOR YOUR FILES

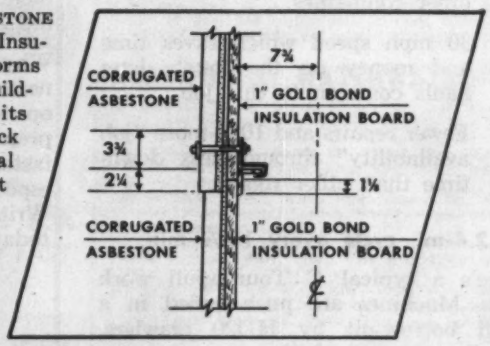
ANOTHER NEW IDEA...

WITH CORRUGATED ASBESTONE

Corrugated Asbestone plus Insulation Board means extra floor space, better insulation for this industrial plant

In this new plant, versatile Gold Bond CORRUGATED ASBESTONE "400" does several important jobs. Used with 1" Gold Bond Insulation Board, fireproof Gold Bond CORRUGATED ASBESTONE forms a thin, rugged wall that *saves floor space* throughout the building. The entire wall is only 2½" thick and, combined with its light weight, has distinct advantages over masonry block or brick construction. CORRUGATED ASBESTONE decorates with natural light and shadow lines... resists weather and corrosion without requiring maintenance.

How many uses can *you* think of for Gold Bond CORRUGATED ASBESTONE? Wherever you use it, you're getting lifetime strength and good looks. For details, write Dept. EN-115, National Gypsum Company, P. O. Box 5257-B, New Orleans 15, La.



NATIONAL GYPSUM COMPANY • BUFFALO 2, NEW YORK

Build better with Gold Bond . . . CORRUGATED ASBESTONE

LATH, PLASTER AND LIME | GYPSUM BOARD PRODUCTS | INSULATION BOARDS PLANKS AND TILES | ROCK WOOL INSULATION | PAINTS AND TEXTURES | ACOUSTICAL TILES | ASBESTOS ROOFING AND SIDING

(Continued from page 126)

Harry Ervin), Denver Club Bldg., Denver, consult. engrs. CD 8/5/54.

▲† **Miss., Meridian**—JET TRAINING BASE—Dpt. Navy, The Pentagon, Wash., D. C., jet training base, $40,000,000. No appropriation. If funds appropriated, work may start in 1957.

▲ **O., Cincinnati**—AIRPORT—City, City Hall, defeated $6,000,000 bonds Nov. 8, municipal airport in Blue Ash, for bldgs., runways, access roads. Vogt, Ivers & Seaman, 34 W. Sixth St., Cincinnati, consult. engrs. CD 7/12.

▲ **Okla., Oklahoma City**—AIRPORT—City, City Hall, bond election Dec. 13, airport extens., imprvs. $4,300,000. Election date extended. W. W. Baker, city engr. CD 10/28.

▲ **Pa., Phila.**—INSTRUMENT RUNWAY AND DIKES—Dpt. Procurement, City Hall Annex, instrument runway and dikes, Phila. International Airport, $3,500,000. CD 1/13/50.

LATIN AMERICA

▲ **Mexico**—Sria de Recurosos Hidraulicos, Reforma, 69, Mexico City, plans irrigation dam at Tunal. $3,600,000.

▲ **Paraguay**—OIL PIPE LINE, etc.—Glenn McCarthy & Assocs., 2121 W. Holcombe St., Houston, Tex., U. S. A., plans crude oil pipe line across the Chaco territory, $42,000,000; constr. refinery on banks of Paraguay River, $10,000,000, both in Ascuncion area.

PUBLIC BUILDINGS

▲ **Calif., Covina**—SCHOOLS—Covina School Dist., Covina, $3,500,000 bond election Jan. 20, schools imprvs.

▲ **Calif., Nevada City**—SCHOOLS—Nevada County Union High School District, Grass Valley, defeated $2,198,000 bonds, high school and Junior High Schools in Grass Valley and Nevada City. CD 1/4.

▲† **Calif., Oakland**—TRANSIT FACILITIES—Dist. P. Wks. Office, 12th Naval Dist., San Bruno, 1 story, rein.-con. refrigerated transit facility, Naval Supply Center. $1,400,000. Indenco Eng., Inc., 960 18th Ave., consult. engr.

▲ **Calif., San Jose**—OFFICE JAIL—Santa Clara Co., Court House, plans by Frank C. Truseder, 408 Bella Vista Ave., Los Gatos, 3 story, bsmnt., sheriffs' office and county jail. $1,000,000. CD 10/28.

▲ **Calif., San Mateo**—SCHOOLS—San Mateo City Elementary School Dist., 117 N. San Mateo Dr., voted $2,000,000 bonds Nov. 8, schools. CD 9/13.

▲ **Colo., Aurora**—SCHOOLS—School Dist. No. 28-J, 1255 Kenton St., voted bonds Oct. 28, Junior High School, elementary school; existing grade school addn. $1,110,000. Atchison & Kloverstrom, 257 Josephine St., Denver, consult. engrs.-archts. CD 10/13.

▲ **Ga., Gracewood**—HOME EXPANSION—State Welfare Dpt., State Office Bldg., Atlanta, Home for Mental Defectives expansion, Gracewood. $1,000,000.

▲ **Ill., Fort Sheridan**—Housing—U. S. Eng. 475 Merchandise Mart, Chicago 54, Ill., family housing, No. 11-032-56-27. $1,528,000. CD 11/10, under LB.

▲ **Kan., Junction City**—SCHOOL—Bd. Educ., voted $1,400,000 bonds Oct. 25, high school, Schmidt, McVay & Peddie, 1832 E. 2 St., Wichita, archts. CD 10/12.

▲ **Mich., Coldwater**—CUSTODIAL—State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, custodial bldgs., Coldwater State Home and Training School, $1,500,000.

▲ **Mich., Lapeer**—NURSERY—State, A. N. Langius, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, nursery, Lapeer State Home and Training School, $2,000,000. CD 1/23/52.

▲ **Mich., Troy**—SCHOOL—Troy Twp. Bd. Educ., 3179 Livernois St., voted $1,500,000 bonds Oct. 31, schools. CD 10/5.

▲† **Minn., Minneapolis**—COURT HOUSE, etc.—General Services Admin., General Services Bldg., Wash. 25, D. C., plans by Thorshov & Cerny, 400 Metropolitan Bldg., and Lang & Raugland, 802 Wesley Temple Bldg., 5 story, penthouse federal court house and office. $3,366,000. CD 11/7/45.

▲† **Minn., St. Paul** — POST OFFICE, etc. — General Services, GSA Region 6, 2306 E. Bannister Rd., Kansas City, Mo., plans by Brooks Cavin, 360 Robert St., and Ellerbe & Co., E. First National Bank Bldg., exten., remodeling post office and custom house as a lease-purchase project bldg. $5,235,000. Plans completed May 1956.

▲ **Mich., Rochester**—SCHOOL—City, Bd. Educ., $1,150,000 bond election Dec. 12, schools incl. high school gymnasium, $350,000.

▲ **Neb., Columbus**—HIGH SCHOOL—Bd. Educ., Columbus, voted bonds Nov. 8, high school, $1,500,000. CD 10/26.

▲ **Neb., Kearney**—SCHOOLS—Bd. Educ., Kearney, defeated bonds Nov. 8, new high school, new elementary school, conversion of one elementary school to Junior High School. $2,200,000. CD 10/11.

▲† **N. J., Trenton**—ALTITUDE TEST CHAMBER—Dpt. Navy, Phila. Naval Base, Phila., Pa., plans by Kelly, Gruzen & McConathy, Hoffman & Assocs., 744 Broad St., Newark, altitude test chamber addn., at Naval Aeronautical Testing Turbine Laboratory, $3,218,000.

▲ **N. Y., Plainedge**—SCHOOL—Bd. Educ., voted Nov. 5 to construct high school, $4,500,000. CD 11/1.

▲ **O., Cleveland Heights**—SCHOOLS—City, School Bd., voted $5,000,000 bonds Nov. 8, schools. CD 7/14.

(Continued on page 132)

Judges of 1955 **SIGNIFICANT PLANT AWARDS** say:

"Quite a roof! . . No painting involved either inside or out"

Among the 1955 winners of FACTORY MANAGEMENT AND MAINTENANCE's Significant Plant Awards is Sunstrand Machine Tool Co. of Belvidere, Ill. This modern plant received a special award going to "plants that are outstanding in some one respect, or in which there is an unusual feature of broad significance."

Sunstrand is cited for its installation of Ingersoll Roof Deck. Here are some of the words used by FACTORY to describe the decking:

"Quite a Roof! . . . This construction provides high rigidity and strength with 8-ft. purlin spacing. This despite the fact that the panels have full freedom for expansion and contraction . . . high reflective property of aluminum cuts summer heat. No painting involved either inside or out."

The Ingersoll Roof Deck used in the new Sunstrand plant is a system of full-floating panels that simply clip to galvanized steel sub-purlins which are precision spaced and welded to the building purlins.

No field or maintenance painting is necessary . . . erection is fast and easy. The permanently bright surface of the panels improves plant lighting.

The plant completed. Its award-winning Ingersoll Roof Deck reduces maintenance costs and problems.

Available in aluminum and porcelain enamel

Ingersoll Roof Deck is available in either aluminum or porcelain enamel. The latter offers all the advantages described above . . . plus protection where corrosion or excessive moisture is a problem . . . or where the special gleaming look of double coats of porcelain enamel is an advantage.

Write today!

New Ingersoll Roof Deck may be just right for your next job. Illustrated folders on both aluminum and porcelain enamel types are now available to give full details of this award-winning new system!

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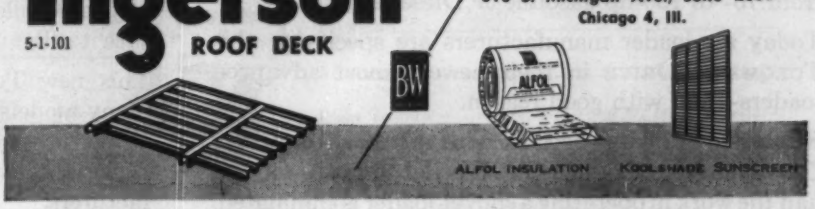
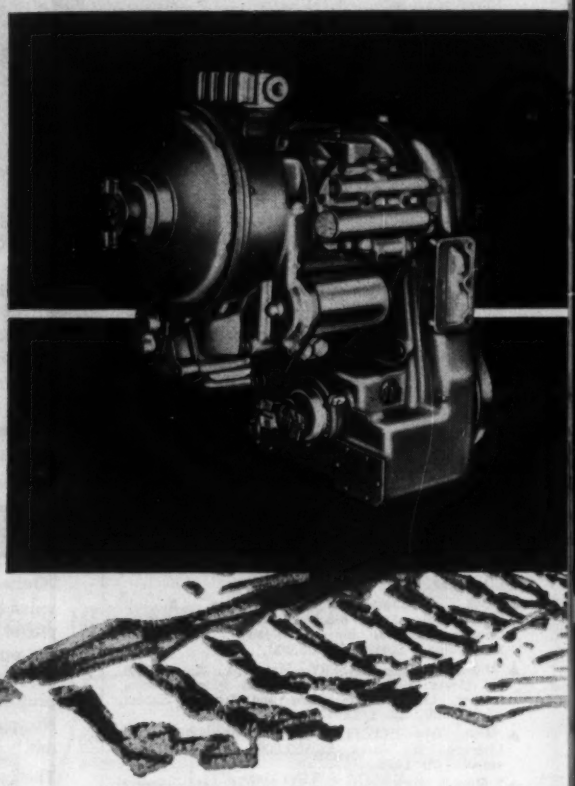


NOW TORQMATIC DRIVE for Shovel-Loaders



- ✯ *One Compact Unit*
- ✯ *Speeds Job-Cycle Time*
- ✯ *Cuts Maintenance Cost*
- ✯ *Reduces Driver Fatigue*

SHOVEL-LOADER manufacturers called on Allison's vast TORQMATIC experience to develop a completely modern converter-transmission team for both 2- and 4-wheel-drive models—and here it is!

It's a TORQMATIC Converter, Transmission and transfer gear drop box combined in one rugged, compact, completely self-contained unit that transmits power from 70- to 130-hp gasoline *or* Diesel engines.

Today six loader manufacturers are specifying this TORQMATIC DRIVE in their newest, most advanced loaders—and with good reason.

Easier to operate—because, with this new TORQMATIC DRIVE, drivers have no clutch pedal to push — about half the work in operating a shovel-loader is eliminated.

Faster working—drivers quick-shift on the go without slowing down. And the TORQMATIC DRIVE also broadens the engine's useful horsepower range for faster, more efficient digging and hauling.

Repair bill savings—eliminates shock-load damage to engine and drive-train components. Fewer engine overhauls because engine lugging and stalling is ended.

If you'd build or buy a better loader, be modern — be sure it's TORQMATIC-equipped.

This new TORQMATIC DRIVE is now available in many models of shovel-loaders — both gasoline- and Diesel-powered — and will soon be offered in a wide range of other equipment made by leading manufacturers.

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For more information on this great new TORQMATIC DRIVE, fill out the coupon and mail it today.

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Please send me complete information on the new Allison TORQMATIC Converter-Transmission unit.

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*I am interested in this TORQMATIC Converter-Transmission unit for*_____
(type of equipment)

(Continued from page 129)

▲ O., Conneaut—SCHOOL—Bd. Educ., defeated $1,500,000 bonds Nov. 8, addn. to Junior High School and 2 bldgs. for elementary school addns. Ward & Conrad, 266 Hanna Bldg., Cleveland, Zone 15, archts. CD 7/22.

▲ O., Euclid—SCHOOLS—Bd. Educ., 23131 Lakeshore Blvd., approved 4-mill levy Nov. 8, to raise $4,500,000 over next 5 years for constr. schools. CD 4/15.

▲ O., Fremont—SCHOOL—Bd. Educ., voted $2,900,000 bonds Nov. 8, high school, remodel existing bldg. for Junior High School. CD 7/20.

▲ O., Lakewood—CITY HALL—City, 14532 Lake Ave., Zone 7, defeated $1,500,000 bonds Nov. 8, city hall, Harlan F. Bartels, city engr. CD 7/22.

▲ O., Maple Heights—SCHOOL—Maple Heights Bd. Educ., Herbert L. Greene, chn. Bldg. Comn., 5500 Clement Dr., voted $1,200,000 bonds Nov. 8, Junior High School, Outcalt, Guenther & Assoc., 13124 Shaker Square, Cleveland, Zone 20, archts. CD 8/15.

▲ O., Painesville—HOSPITAL—Bd. Comrs. Lake Co., Court House, 470 N. Park Pl., voted $1,500,000 bond Nov. 8, 4 story hospital wing. CD 8/15.

▲ O., Springfield—SCHOOL—Springfield School Dist., 49 E. College Ave., voted $5,200,000 bonds Nov. 8, high school, 3 elementary schools, plus 8 other school addns. $4,630,000. CD 7/19.

▲ O., Warren—OFFICE—Comrs. Trumbull Co., County Court House, defeated $1,275,000 bonds Nov. 8, 4 story county office, Harold H. Hunter, 123 W. Market St., archt. CD 8/11.

▲ O., Wickliffe—SCHOOL—Bd. Educ., 2940 Euclid Ave., voted $1,100,000 bonds Nov. 8, schools. Outcalt, Guenteh & Assoc., 13124 Shaker Square, Cleveland, Zone 20, archts. CD 8/19.

▲ Tex., Spring Branch—SCHOOLS—Spring Branch Independent School Dist., Spring Branch, voted bonds Oct. 29, Junior High School, $2,000,000; No. 1 Elementary School, $575,000; No. 2 Elementary School, $450,000; No. 3 Elementary School, $426,000. CD 10/12.

▲ Tex., Waco—SCHOOLS—Waco Independent School Dist., Box 27, Junion High School (Crestview-Hillcrest area) $1,000,000; Junior High School (Kendrick area) $750,000; elementary school (Parkdale addn.) $400,000; elementary school (Lake Air Village area) $400,000. CD 10/20/49.

▲ Va., Fairfax—HOSPITAL—Bd. Supervs. Fairfax Co., Court House, voted bonds Nov. 8, 300-bed general hospital. $3,000,000. CD 10/10.

▲ Va., Fairfax—SCHOOLS—Fairfax Co. Bd. Educ., Court House, voted bonds Nov. 8, school constr. $22,000,000. CD 9/16.

▲ Va., Hopewell—SCHOOL—City, voted bonds Nov. 8, school. $1,000,000.

▲ Ont., Kingston—MILITARY HOSPITAL—Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, plans by Shore & Moffatt, 79 Queen St. E., Toronto, 4 story, 50x281 ft., and 50x136 ft. T-shaped, rein.-con., brick, military hospital, $2,000,000. Bids this fall. CD 3/9/53.

▲ Ont., Oakville—SCHOOL—Oakville & Trafalger Twp. High School Bd., 135 Church St., plans by Shore & Moffat, 79 Queen St. E. Toronto, high school, $1,100,000. Bids in mid-November. CD 5/9.

▲ Ont., Ottawa—PATHOLOGY, etc.—City, City Hall, 4 story, 190-room, 10 operating rooms, pathology bldg. addn. off east wing of Civic Hospital, $2,800,500; new bldg. connecting east wing with Pathology Bldg., incl. admitting and emergency depts., records, library, $800,000. CD 12/31/51.

▲ Que., Quebec City—POST OFFICE—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., plans by G. Fernand Caron, 144 St. Jean St., post office, Henderson St. Over $2,000,000. CD 2/8.

COMMERCIAL BUILDINGS

▲ Calif., Palo Alto—HOUSING—Bd. Trustees, Stanford University, Palo Alto, plans by Skidmore, Owings & Merrill, 1 Montgomery St., San Francisco, housing $50,000,000-$55,000,0000. Owner will lease land to builder.

▲ Ill., Chicago — OFFICE — Adams-Monroe Wacker Corp., c/o Arthur Rubloff & Co., 100 W. Monroe St., 6 story, 627,700 sq. ft. co-operative office bldg., S. Wacker Dr. between Adams and Monroe Sts., $17,500,000.

▲ Ill, Evanston—HOSPITAL—Evanston Hospital Assn., 2650 Ridge Ave., plans by Burnham & Hammond, 53 W. Jackson St., Chicago, Zone 4, 6 story, bsmnt. hospital addn. $3,500,000.

▲ Mich., Detroit—HOSPITAL—Highland Park General Hospital, Norbert M. Temple, dir., 369 Glendale St., Highland Park, Zone 3, hospital wing addn., rebuilding and modernizing interior of hospital, $1,500,000.

▲ Mich., Lansing—HOTEL—Julius Epstein & Assoc., 231 S. LaSalle St., Chicago, Ill., 2 story, brick, steel, L-shaped HOTEL, Main St. and Washington Ave., $1,400,000.

▲ Mich., Southfield—HOSPITAL—Providence Hospital, 2500 W. Grand Blvd., Detroit, plans by Giffels & Vallet, Inc., 1000 Marquette Bldg., Detroit, 9 story hospital, 5 story nurses home, Nine Mile Rd. and Greenfield. $8,000,000. CD 10/31.

▲ Mo., St. Louis County—MAUSOLEUM, etc.—Laurel Hills Chapels, Inc., Ray L. Johnson, pres., c/o Laurel Hill Cemetary, 2000 N. Pennsylvania Ave., Zone 14, plans by J. T. Golawbowski, 1221 Locust St., St. Louis, Zone 3, 1 story, bsmnt., 59x104 ft., 26x30 ft., 61x46., 101x38 ft. brick, concrete block, steel mausoleum, chapel, administration and sales bldg., Pennsylvania Ave. south of St. Charles Rock Rd., $1,000,000

▲ Mo., St. Louis County—SHOPPING CENTER—Sidney Jacobs, relators, Sydney Jacobs, pres., 6802 Delmar Blvd., University City, Zone 5, plans by Joe. G. Harms & Gerhardt Kramer, 9640 Clayton Rd., Ladue, Zone 24, Northtown at Chambers and West Florissant Roads Shopping center incl. brick, stone, steel 110,400 sq. ft. shopping area and 12,000 sq. ft. office on first floor, parking area on second floor, $1,000,000. CD 9/3/54.

▲ N. Y., New York—HOSPITAL IMPRVS.—Lenox Hill Hospital, Park Ave. and 76 St., plans by Rogers & Butler, 219 E. 44 St., Zone 17, replacement of all old bldgs. in block at Park Ave. and 76 St., $10,000,000. CD 1/4.

▲ N. Y., New York—HEADQUARTERS—Owner, c/o Kahn & Jacobs, archts., 2 Park Ave., Zone 16, bldg. to serve as headquarters for 20 Latin American Countries First Ave. and 45 St. $1,000,000.

▲ O., Avon Lake—HOMES—Kenneth R. Evenson Co., 285 Inwood St., 100 ranch type homes on 53 acre site west of Jaycox Rd. from Lake Rd. to Division St. $2,500,000.

▲ O., North Olmsted—SHOPPING CENTER AND HOMES—Saul Biskind, 4511 Brookpark Rd., Cleveland, Zone 29, shopping center, incl. 40 stores, homes, sewage disposal plant, $8,000,000. Constr. in March or April.

▲ O., Solon—HOMES—Edgemoor Builders, Robert D. McKellogg, pres., 3720 Rolliston Rd., Cleveland, Zone 20, plans by J. Trevor Guy, 7113 Euclid Ave., Cleveland, Zone 3, 71 homes, $1,500,000. Construction about first of the year.

▲ Tex., Amarillo—OFFICE—J. L. Nunn, Radio Bldg., Lexington, Ky., multi-story office, 5th and Polk Sts. $1,000,000.

▲ Wash., Bellevue—SHOPPING CENTER—Eastgate Investment Co., c/o A. G. Bennett, 6401 Carleton St., Seattle, plans by John Graham & Co., 1426 5 Ave., Seattle, shopping center at Eastgate. $10,000,000. Work to start this year on first three units.

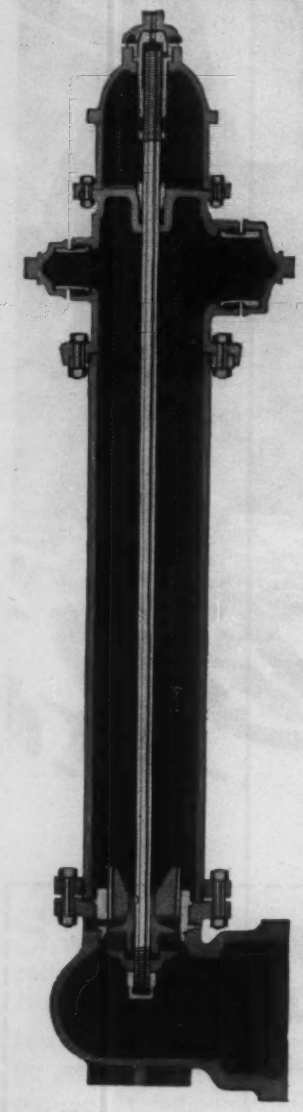
▲ Wash., Des Moines—HOUSES—20th Century Homes, Inc., 8508 Briggs Lane S.W., Tacoma, 100 houses at Thunderbird Estates, east of here. $1,000,000.

▲ Wis., Silver Lake—COLLEGE—Holy Family Convent, Silver Lake, sketches by E. Brielmaier & Son, 735 N. Water St., Milwaukee, Zone 2, college bldgs. $2,000,000.

▲ Alta., Edmonton—HOUSING—Maclab Constr. Co., Ltd., Edmonton, 2,000 dwellings and shopping center, 311-acre site, $25,000,000.

▲ Alta., Edmonton—APARTMENT—Town House Apartments, Ltd., Edmonton, plans by Blakey, Blakey &

(Continued on page 134)



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For maximum reliability at lowest cost, you can't buy better than the Mathews Flange Barrel Hydrant. It has all the features that you look for in a top-quality hydrant — internal parts removable through the barrel, compression-type valve to prevent leaking in case of damage, completely revolving head. In addition, every friction point is protected by at least one bronze surface, and all water-carrying areas are designed to reduce friction and loss of pressure.

And at slight extra cost...

The Breakable Flange and Stem Coupling—A specially designed flange in the standpipe just above ground level and a frangible coupling in the hydrant stem are both designed to snap when struck a blow heavy enough to break the hydrant. Both can be replaced quickly and inexpensively without excavation, while the rest of the hydrant remains undamaged.

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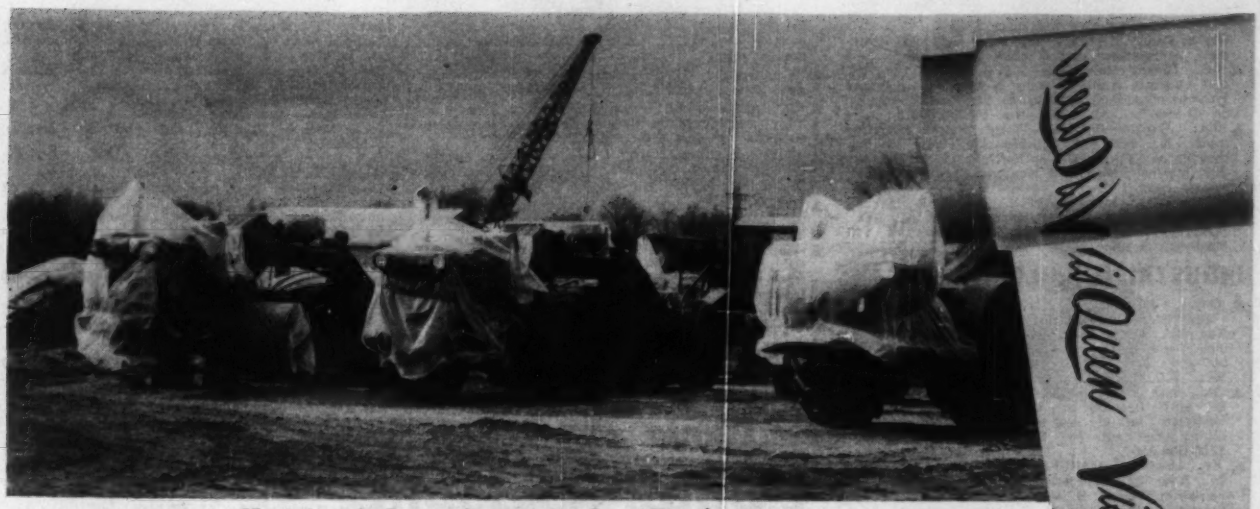

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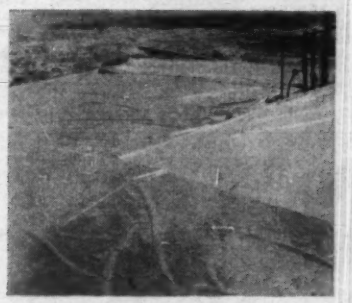

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Name_____

Title_____

Products_____

(Continued from page 132)

Ascher, 10042 109 St., 208 suite low-rental apartment, northwestern part of town $1,250,000.

▲ Ont., Toronto—HOUSING—S & G Holdings Ltd., c/o 534 Lawrence Ave. W., plans by E. G. Faludi, town planning consultant, 614 Church St., housing program on 90-acre lot, incl. 328 houses. $9,000,000.

▲ Ont., Toronto—HOUSING—Yonge Heights Development Ltd., c/o 850 Eglinton Ave. West, housing program on 114-acre site on North Yonge St. $5,000,000. Marshall, Macklin & Monaghan, 154 Merton St., consult engrs.

▲ Que., Sherbrooke—SHOPPING CENTER—Maxwell Cummings & Sons, 1390 Sherbrooke St. W., Montreal, plans by Ian Martin, 1200 St. Alexandre St., Montreal, shopping center, King St. $1,750,000.

INDUSTRIAL BUILDINGS

▲ Conn., Glastonbury—ATOMIC REACTOR PLANT, etc.—Combustion Engineering, Inc., 200 Madison Ave., New York, N. Y., atomic reactor plant, administration bldg., metallurgical research bldg., small rolling mill, 500-acre tract west of Main St., South Glastonbury Sect. $10,000,000.

▲ Ind., East Chicago—MILL EXPANSION—Inland Steel Co., 38 S. Dearborn St., Chicago 3, Ill., 3 year mill expansion, incl. (1) new blooming mill, (2) 2nd cold rolling sheet mill and (3) increase in strip mill, $260,000,000.

▲ Ky., Louisville—MANUFACTURING—General Electric Co., River Rd., Schenectady, N. Y., plans by F. A. Fairbrother & Geo. H. Miehls, 345 New Center Bldg., Detroit, Mich., 440x600 ft., steel, concrete brick Mfg. Bldg. No. 6, Benchel. $5,000,000. CD 10/11.

▲ Md., Towson—LABORATORY—Crown, Cork & Seal Co., Eastern Ave. and Kresson St., Baltimore, plans by Lucius R. White Jr., 1009 N. Calvert St., Baltimore, Zone 2, 1 and 2 story, brick, rein.-con., steel research laboratory, Cromwell Bridge Rd., east of here, $1,500,000.

▲ Mo., Riverside—PLANT—Dow Chemical Co., Midland, Mich., 100,000 sq. ft. Riverside Plant to produce styrofoam. $1,000,000.

▲ Mo., St. Louis County—INDUSTRIAL PLANT TRACT—Industrial Properties, Inc., Andrew W. Bauer, pres., 34 N. Brentwood Blvd., Clayton, Zone 5, development of industrial tract of 47½ acres to provide 2,000,000 sq. ft. space for 25 industrial plants each on about 2 acres for plant and warehouse space, railroad trackage, 44 ft. wide roadway through tract, Lindbergh Blvd. and Warson Rd. south of Chicago, Rock Island & Pacific R.R. $15,000,000. Albert W. Wenthe, 34 N. Brentwood Blvd., Clayton, Zone 5, industrial consultant.

▲ Nebraska—POWER PLANT—Consumers Public Power District of Nebraska, 1452 25th Ave., Columbus, 75,000 kilowatts sodium cooled, graphite moderated nuclear power plant. To be completed in 1959. Revised proposal accepted by AEC. North American Aviation, Inc., 12241 Lakewood Blvd., Downey, Calif. consult. engr.

▲ O., Cleveland—PLANT—Yoder Co., 5500 Walworth Ave., Zone 2, 300,000 sq. ft. plant. $4,500,000.

▲ O., Ironton—PLANT—Dow Chemical Co., Midland, Mich., 100,000 sq. ft. Hanging Rock Plant to produce styrofoam, on Ohio River. $1,000,000.

▲ Okla., Locust Grove—MILL—Hercules Portland Cement Co., Locust Grove, 1,500 bbl. portland cement mill. $1,000,000. Hershel Wilkinson, c/o owner, co. engr.

▲ Tex., High Island—PLANT—Sulphur Exploration Co., 1st Natl. Bank Bldg., Houston, sulphur mining plant. $1,250,000.

▲ Wash., Mukilteo—REFINERY—Standard Oil Co. of California, 225 Bush St., San Francisco, Calif., refinery 2,000 acre site. Site purchased but start indefinite.

▲ B. C., Burnaby—PLANT—Sidney Roofing & Paper Co. Ltd., 47 Songhees St., Victoria, paper plant, 55-acre site along Fraser River between Wiggins and Minto Sts. $4,000,000.

▲ Man., Winnipeg — PARKING GARAGE — Canadian & General Development Corp., 608 Fifth Ave., New York, N. Y., 5-deck parking garage, Ellice and Notre Dame Aves. $1,500,000.

UNCLASSIFIED

▲ Calif., Port Chicago—MAGAZINES, GUIDED MISSILE FACILITY—Dist. P. Wks. Office, 12th Naval Dist., San Bruno, 20 magazines, $1,000,000. Morton Eng. Co., Inc., 109 Stevenson St., San Francisco, consult. engr.; plans by John Carl Warnecke, 507 Howard St., San Francisco, guided missile facility, $600,000.

▲ Calif., San Francisco—PLAYGROUNDS, etc.—City and San Francisco Co., Public Utilites Comn., City Hall, voted $7,000,000 bonds Nov. 8, playgrounds and parks.

▲ Ga., Atlanta—YARD EXPANSION—Louisville & Nashville R.R. Co., L. L. Adams, ch. engr., 908 W. Broadway, Louisville 1, Ky. Hills Park Yard expansion. $8,000,000. CD 7/23/54.

▲ Kentucky—RURAL DISTRIBUTION LINES—Pennyrile Rural Electric Co-operative Corp., Hopkinsville, 430 mi. rural distr. lines, sys. imprvs., Todd Co. $2,020,000. CD 5/26/54.

▲ N. J., Jersey City—PIER—City, City Hall, reconstr. Municipal Pier B. $2,200,000.

▲O., Cleveland—HARBOR IMPRVS.—City, City Hall, Zone 14, voted $8,000,000 bonds Nov. 8,

HARBOR IMPROVEMENTS

Outer Docks bulkheading, $4,280,000;
Outer Docks, fill, $1,300,000;
West Basin—Outer Docks, roads, $330,000;
West Basin—Inner Docks, road, $300,000;
Bath St. tract (W. Third to River), roads, $250,000;
Bath St. tract (W. Third St. to River) W. Third St. dock and W. Ninth St. dock, bulkheading, $1,420,000;
Bath St. tract (W. Third to River) W. Third St. dock and W. Ninth St. dock, dredging, $600,000;
Bath St. tract (W. Third to River) W. Third St. dock and W. Ninth St. dock, fill, $1,500,000;
Lower Mall—bulkheading, $1,120,000;
Lower Mall—sewer exten., $80,000;
Lower Mall—E. Ninth St. ramp, 1,000 ft. grading, $150,000;
East Basin (E. 38-Gordon Park) bulkheading, West Island, $2,400,000;
East Basin (E. 38-Gordon Park) bulkheading, East Island, $600,000;
East Basin (E. 38-Gordon Park) bulkheading, peninsula, $600,000;
East Basin (E. 38-Gordon Park) bulkheading, shore, $2,400,000;
East Basin (E. 38-Gordon Park) bulkheading, Island "A", $800,000;
East Basin, roads, $840,000;
East Basin (E. 38-Gordon Park) sewer extens., $130,000;
Gordon Park bulkheading, $1,100,000;
Gordon Park—Doan Brook exten., $2,250,000. CD 7/29.

AIRPORT IMPROVEMENTS

1st stage runways, $600,000;
East Ninth St. ramp, $150,000;
Marginal Rd., $240,000;
1st stage bulkheading, $2,400,000;
1st stage fill, $750,000;
1st stage sewers, $120,000;
Marginal Road, $120,000;
2nd stage bulkheading, $1,000,000;
2nd stage fill, $2,600,000;
2nd stage sewers, $260,000;
2nd stage runways, $150,000. CD 10/25.

BRIDGE

West Basin—Inner Docks, Cuyahoga Bridge, $3,000,000. CD 8/25.

▲ Okla., Oklahoma City—PARK IMPRVS.—City, City Hall, bond election Dec. 13, municipal park imprvs. $1,200,000. Election date extended. W. W. Baker, city engr. CD 11/3.

▲ Okla., Oklahoma City—FAIRGROUNDS IMPRVS.—City, City Hall, bond election Dec. 13, fairgrounds imprvs. $7,085,000. Election date extended. W. W. Baker, city engr. CD 10/28.

▲ Pa., Harrisburg—UNDERGROUND PARKING GARAGE—General State Auth., 18 and Herr Sts., underground parking garage on Capitol Grounds near Health and Welfare Bldg. $2,345,000. A. F. Jones, ch. engr.

▲ Que., Montreal—PARK and ZOO—City, City Hall, Angrignon Park and Zoo at west end of Cote St. Paul Rd. $7,000,000. McFadzean, Everley Ltd., c/o Brouillet & Carmel, 3600 Barclay Ave., consult engrs. Lucien L'Allier, c/o owner, ch. engr. CD 1/31/50.

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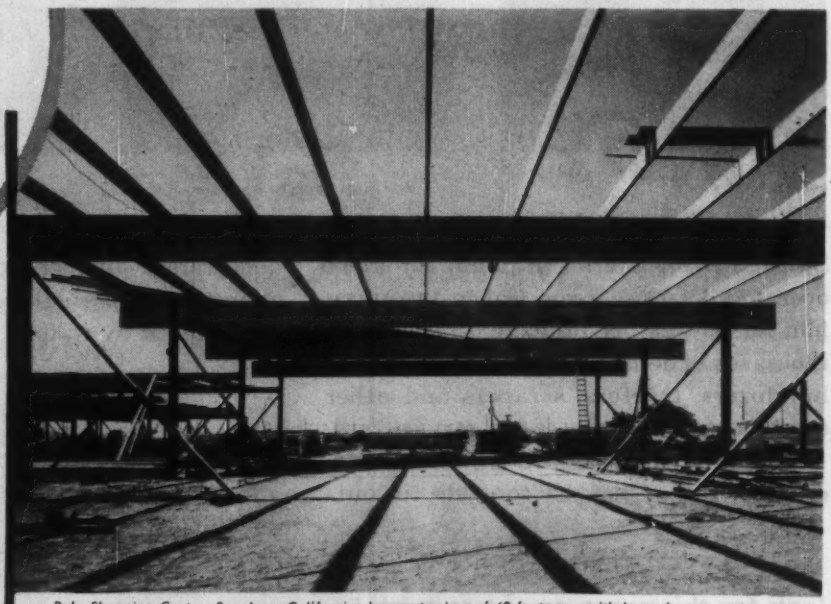

Pala Shopping Center, San Jose, California, has center bay of 60-foot span with lower bays at either side. Clerestory windows are placed beneath overhanging roof of center bay. Architect: Victor Gruen & Associates, San Francisco and New York. Lew Jones Construction Co. of San Jose was general contractor.

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Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
December 14 Rhode Island

BUILDINGS—BA

▲ **Mass., Quincy** — SCHOOL — BA 12/8 — City, School Dpt., 70 Coddington St., Junior High School, off Sea St. (Broadmeadows) Calvin Rd. $1,250,000. Plans deposit $50, refundable. Childs & Smith, 20 N. Wacker Dr., Chicago, Ill., archts. Harry J. Korslund, 506 Washington St., Norwood, assoc. archt. CD 4/1.

▲ **Mass., Hull**—SCHOOL—BA 12/15—Town, School Planning Bldg. Comn., c/o Supt. Schools, 81 Central St., high school, Pemberton Section, Wind Mills Point. $1,900,000. Plans deposit $50. Kilham, Hopkins, Greeley & Brodie, 9 Arlington St., Boston, archts. CD 11/3/54.

BUILDINGS—LB & CA

▲ **Davison Constr. Co., Inc.,** Manchester, N. H., LB $1,953,000. Proj. NH-54-C-2AA, Senior HIGH SCHOOL, PORTSMOUTH, N. H. City, Chmn. Joint Bldg. Comn., City Hall, 125 Daniel St., Portsmouth, N. H. Bids Nov. 10. CD 11/2.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
December 1 New York December 2 Pennsylvania
STREETS AND ROADS
December 1 New Jersey, New York
December 2 Pennsylvania

▲† **N. Y., Mitchel Field**—RUNWAY, etc.—BA 12/13—U. S. Eng., 111 E. 16 St., New York, Zone 3, runway and apron exten. Airfield Facilities (FY 1956 Program), Serial No. ENG-30-075-56-132. $1,000,000-$1,500,000. Plans deposit $5. CD 10/19.

BUILDINGS—BA

▲ **New York**—SCHOOL—BA 12/9—Director, Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. P. S. 50, Adelaide Ave. between Clawson and Platt Sts., Oakwood, Richmond Boro. Plans deposit $30.

▲ **N. Y., Brooklyn**—SCHOOL—BA 12/9—Director, Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. new addn. to and modernization of existing Bushwick High School, Irving Ave. and Woodbine St. $2,400,000. Plans deposit $30. CD 1/20.

▲ **N. Y., Brooklyn**—SCHOOL—BA 12/12—Director, Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. new Junior High School 61, Empire Blvd., New York Ave. and Sterling St. $3,100,000. Plans deposit $35. CD 1/20.

▲ **N. Y., Brooklyn**—SCHOOL—BA 12/13—Director, Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr., moderinzation of Erasmus Hall High School, Flatbush and Church Aves., $2,600,000. Plans deposit $35. CD 1/20.

▲ **N. Y., Brooklyn**—SCHOOL—BA 12/13—Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. P. S. 261, Pacific, Hoyt and Smith Sts. Plans deposit $25. CD 1/19.

▲ **Pa., New Castle**—SCHOOL—BA 12/13—School Auth. of New Castle, School Dist., brick, block, steel Senior High School addn., alteration, $1,500,000. Plans deposit $25, W. G. Eckles Co., Lawrence Savings Trust Bldg., archt. CD 3/24.

▲ **N. Y., Brooklyn**—HIGH SCHOOL—BA 12/14—Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. new Junior High School 33, Stockton and Floyd Sts. and Tompkins Ave. Plans deposit $30. CD 1/19.

▲ **N. Y., New York**—SCHOOL—BA 12/15—Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. P. S. 140, E. 163 St. between Eagle and Cauldwell Aves., Bronx Boro. Plans deposit $25. CD 1/20.

▲ **N. Y., New York**—SCHOOL—BA 12/16—Bd. Educ., Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr. P. S. 129, Convent Ave. and W. 130 St. Plans deposit $30. CD 1/20.

▲ **N. J., Yardville**—PLANT—Bids Asked—Bonafide Mills, Inc., 295 Fifth Ave., New York, N. Y., mfg. plant. $1,000,000.

▲ **Pa., Broomall**—SHOPPING CENTER—Bids Asked—Laurence Park Shopping Center, 160 Long Lane, Upper Darby, shopping center, parking area. $10,000,000. George W. Neff, 1520 Locust St., Phila., archt.

BUILDINGS—SLC

▲ **Pa., Elkins Park**—APARTMENTS—Albert Toll, Elkins Park, soon lets contract, 250-unit apartment bldgs. parking area, garage. $4,000,000. Aaron Colish, 117 S. 17 St., Phila., archt. Dorfman Bloom, 1411 Walnut St., Phila., engr. CD 4/9/54.

HEAVY CONSTRUCTION—LB & CA

▲ **Alco Products, Inc.,** 30 Church St., New York, N. Y. LB $1,834,144. furnish, deliver towers, guides and sills for Barnhart Island Power Plant, Long Sault Dam and Massena Intake, Spec. No. PA-5-15066, St. Lawrence Contr. No. P-19, NEW YORK. The Power Auth. of State of New York, 270 Broadway, New York 7, N. Y. Bids Nov. 15. CD 10/27.

BUILDINGS—LB & CA

▲ **Psaty & Fuhrman, Inc.,** 369 Lexington Ave., New York 17, N. Y. LB $4,498,000. (5 bidders) Junior and Senior High SCHOOL with swimming pool, GREAT NECK, N. Y. Bd. Educ., 345 Lakeville Rd., Great Neck, N. Y. Bids Nov. 11. CD 10/7.

▲ **Whitebirch Homes,** c/o Karl Block, archt., 7 Landsdown Ave., Merrick, N. Y. Owner Builds. $3,200,000. 200 HOUSES on tract on Bulwer Ave., east of Broadway, HICKSVILLE, N. Y.

▲ **William Kaufman & Jack D. Weiler,** c/o Herbert Tannenbaum, archt., 205 E. 43 St., New York 17, N. Y. Owner Builds. $1,300,000. 16 story OFFICE, 405 Park Ave., northeast corner of 54 St., NEW YORK, N. Y.

▲ **Sprain Lake Knolls,** c/o Oscar Silverstone, archt., 666 Fifth Ave., New York 19, N. Y. Owner Builds. $6,300,000. 350 HOUSES on tract on Mountaindale Rd., north of Tuckahoe Rd., YONKERS, N. Y.

▲ **Bel-Air Homes, Inc.,** 5109 Chester Ave., Phila., Pa., Separate Contracts, $3,500,000. RESIDENTIAL DEVELOPMENT, Washington Ave., BERLIN, N. J. Dante J. D'Anastasio, 1815 Federal St., Camden, N. J., archt.

▲ **Heston Homes, Inc.,** Heston Ave., Glassboro, N. J., Separate Contracts, $1,000,000. RESIDENTIAL DEVELOPMENT, Heston Ave., GLASSBORO, N. J. Dante J. D'Anastasio, 1815 Federal St., Camden, N. J., archt.

▲ **Briar Point Homes, Inc.,** c/o Stanley J. Shaftel, archt., 166-21 90 Ave., Jamaica, N. Y. Owner Builds. $4,000,000. 374 HOUSES, 103-acre tract between Englishtown Rd. and Route 18, OLD BRIDGE, N. J.

▲ **Karen Constr. Co.,** Att. Lawerence Galliano, 3100 Bridge Ave., Point Pleasant, N. J. Separate Contracts, $1,262,000. RESIDENTIAL DEVELOPMENT, Tree Needle Ave., POINT PLEASANT, N. J.

▲ **Joseph R. Farrell, Inc.,** 4424 Market St., Phila., Pa. CA $1,000,000. LAW SCHOOL, VILLANOVA, PA. Villanova University, Villanova, Pa. Bids Nov. 7. CD 11/2.

▲ **Birdsboro Steel Foundry & Machine Co.,** Birdsboro, Pa., CA, Total est. $6,250,000. design, build and erect 4 extrusion presses to increase production from 24-46 million lbs. per year, HALETHORPE, MD. Kaiser Aluminum & Chemical Co., Halethorpe, Md.

▲ **Ajax Constr. Co.,** 1107 19 St. N. W., Wash. D. C., CA Est. $1,000,000. 8 story, BUILDING, 17 and Rhode Island Ave. N. W., WASH., D. C. B'Nai B'Rith, 1003 K St. N. W., Wash., D. C. Bids Sept. 28, awarded Nov. 16. CD 9/30, under LB.

▲ **Casualty Hospital,** 708 Massachusetts Ave. N.E., Wash., D. C., rejected bids Oct. 4. HOSPITAL addns., alterations, WASH., D. C. LB $1,959,900. Will re-advertise. CD 10/7, under LB.

▲ **Food Fair Stores, Inc.,** 2223 E. Allegheny Ave., Phila., Pa. Separate Contracts. $1,000,000. SUPER MARKET and SHOPPING CENTER, DOVER, DEL. CD 9/13/54.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
November 29 North Carolina November 30 Kentucky
November 30 Louisiana December 2 Alabama
STREETS AND ROADS
November 29 North Carolina November 30 Kentucky
November 30, December 7, 21 Louisiana
December 2 Alabama

BUILDINGS—BA

▲ **La., Lafayette**—BIOLOGICAL SCIENCE—BA 12/8—Louisiana State Bldg., State Capitol, Baton Rouge, Proj. AE-Sli-2, 2 story biological science bldg., Southwestern Louisiana Institute. $1,000,000. Plans deposit $50. Robert L. Stephan, 901 Lee Ave., archt. CD 8/9.

HEAVY CONSTRUCTION—LB & CA

▲ **Tidewater Constr. Corp.,** Box 57, Norfolk, Va., LB $6,339,000, Hampton Roads Proj. Contr. C-3, constr. cut and cover tunnel sects., ventilation bldgs. and tunnel open approaches; crash truck bldgs., incl. foundations, mechanical and electrical work complete, misc. work, incl. railings on tunnel and bridge approaches, hand rail in tunnel, police booths and sidewalks, curbs and walls, rough grading on Portla Islands, VIRGINIA. Commonwealth of Va., Dpt. Hys., Central Highway Office Bldg., 1221 E. Broad St., Richmond 19, Va. Bids Nov. 16. CD 9/30.

▲† **Albert A. Lutz,** 241 W. 17 St., New York, N. Y. LB $1,612,621. hangar and water pump station with water reservoir, Seymour Johnson Air Force Base, ENG-31-075-56-15, GOLDSBORO, N. C. U. S. Eng., 308 Customhouse, Wilmington, N. C. Bids Nov. 8. CD 11/1.

▲ **FLORIDA**—State Rd. Dpt., Tallahassee
Fla.—**W. L. Cobb Constr. Co.,** Box 977, Tampa, Fla., CA, $1,059,945. rock base b. conc., binder course, b. conc. over existing pavement 12.305 mi. State Rd. 5, F-003-5 (2), Brevard Co. Awarded Nov. 9;
Fla.—**Wright Constr. Co.,** Box 1580, Columbus, Ga., CA, $1,265,221. rock base with surf. b. conc., 3 concrete bridges, truck weighing station with truck scales, weighing facilities, 12.318 mi. State Rd. 15, F 003-7(4), Job 7403-203, Nassau Co. Bids Sept. 20. CD 9/26, under LB.

▲ **W. L. Hailey Co.,** 2620 Franklin Rd., Nashville, Tenn., LB, $1,314,922 (3 bidders) Upper Dry Run Trunk Sewers, Section E and Standiford field main, LOUISVILLE, KY. Metropolitan Sewer Dist., 414 W. Jefferson St., Louisville, Ky. Bids Nov. 10. CD 10/24.

BUILDINGS—LB & CA

▲ **Realty Development Corp.,** 927 Walter Reed Dr., Arlington, Va., Owner Builds. $1,500,000. 24-store SHOPPING CENTER between Rte. 236 and Columbia Pike, ANNANDALE, VA. Corning & Moore, 1726 M St. N.W., Wash., D. C., archts.

▲ **W. F. Holt & Sons,** 1119 Laurel St., Nashville, Tenn. CA $1,600,000, est. $1,500,000. 5 story 110,000 sq. ft. OFFICE, NASHVILLE, TENN. Methodist Publishing House, 810 Broadway, Nashville, Tenn. Hart-Freeland & Roberts, Third Natl. Bank, Nashville, Tenn., archts. Awarded Nov. 10.

J. B. Regen, 2221 Bransford Ave., Nashville, Tenn. LB $928,400,, MUNICIPAL SAFETY BLDG. to house city police and fire departments, workhouse, jail, etc., NASHVILLE, TENN. City, City Hall, Nashville, Tenn. CD 4/27.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
STREETS AND ROADS
November 29 Ohio

HEAVY CONSTRUCTION—LB & CA

▲ **Bates & Rogers Constr. Corp.,** 600 W. Jackson St., Chicago, Ill. LB $3,044,746. (6 bidders) railroad overpass in First and Keowee Sts. area, incl. street and sewer work, two overpasses on E. First St. and one on Monument Ave., Pitt St. and Cooper St., DAYTON, O. City, Herbert Starick, city mgr., City Hall, Dayton, O. Bids Nov. 3. CD 6/8.

▲ **Healy Bros. Co.,** 9504 W. 47 St., Brookfield, Ill., LB, $1,176,390, Howard St. Intercepting Sewer, Morton Grove, CHICAGO, ILL. Sanitary Dist. of Chicago, 910 S. Michigan St., Chicago 5, Ill. Bids Nov. 3. CD 10/31, under LB;
John C. Tully Co., 33 N. La Salle St., Chicago 2, Ill., LB, $334,000 Upper Des Plaines Intercepting Sewers, Harwood Heights and Norwood Park (Chicago, Ill.).

BUILDINGS—LB & CA

▲ **Kenneth R. Evenson Co.,** Avon Lake, O. Owner Builds. Est. $2,500,000. 100 HOMES on 53 acre site on south side of Lake Rd., AVON LAKE, O. CD 11/11.

▲ **American Gas & Electric Service Corp.,** 30 Church St. New York, N. Y. CA Est. $28,000,000. design and construct, Unit 4, 225,000 kw. Muskingum River POWER PLANT, BEVERLY, O. Ohio Power Co., 301 Cleveland Ave. S. W., Canton, O., CD 10/20;
General Electric Co., River Rd., Schenectady, N. Y. CA, turbine-generator (Beverly, O.);
Babcock & Wilcox Co., 161 E. 42 St., New York, N. Y., CA, boiler, (Beverly, O.).

▲ **Sam W. Emerson Co.,** 1836 Euclid Ave., Cleveland, O. CA Est. $1,700,000. 1½ story, 100x300 ft. PHYSICAL EDUCATION BLDG., outdoor track and football field, CLEVELAND, O. Case Institute of Technology, 10900 Euclid Ave., Cleveland 2, O. Philip L. Small, c/o Small, Smith & Reeb, 1010 Euclid Ave., Cleveland, O., archts. Wm. L. Hargett, c/o McGeorge-Hargett & Assoc., 7016 Euclid Ave., Cleveland, O., engrs. CD 9/2.

▲ **Caryle Constr. Co.,** 74 E. Gay St., Columbus, O. CA Est. $5,000,000. 270 ranch type and split-level homes, University City Proj., Olentangy Blvd. and Ackerman Rd., COLUMBUS, O. Don M. Casto & Son and Harold Zieg, 42 S. 4th St., Columbus, O.

▲ **Croy Constr. Co.,** 1807 N. Main St., Findlay, O. Owner Builds. $1,200,000. 100 HOMES, between Rte. 12 and U. S. Rte. 224, FINDLAY, O.

▲ **Findlay Plaza, Inc.,** c/o E. J. DeBartolo, 2640 Market St., Youngstown, O. Owner Builds. $1,500,000. SHOPPING CENTER, 25-store, northeast edge of city between Rte. 12 and U. S. 224, FINDLAY, O.

▲ **Midwest Builders,** Leo Goldbert, pres., 2199 S. Green Rd., Cleveland 21, O. Own Forces. $2,184,000. 91 semi-ranch HOMES, Haverston Rd., LYNDHURST, O. Joe. E. McSteen, 13947 Cedar Rd., Cleveland 18, O., engr.

▲ **Hunkin Conkey Co.,** 1740 E. 12 St., Cleveland 14, O. LB $1,056,814 est. $1,500,000 (3 bidders) County HOSPITAL addn., WARRENSVILLE, O. Cuyahoga County Hospital, Court House, Cleveland 13, O. Bids Nov. 10. CD 10/17.

▲ **Mid West Builders,** Leo Goldberg, pres., 2199 S. Green Rd., Cleveland 21, O. Own Forces. $1,650,000, 100 HOMES, Pendley Rd. off of Lake Shore Blvd., WILLOWICK, O. Joseph E. McSteen, 13947 Cedar Rd., Cleveland 18, O., engr. Awarded Oct. 15.

▲ **High Ridge Homes,** 481 Ridge Rd., Highland Park, Ill. Own Forces. $1,000,000. 60 HOMES, HIGHLAND PARK, ILL. A. J. Del Bianco, 55 W. Irving Park Rd., Chicago, Ill., archt.

Thos. H. Bentley & Son, 3131 W. Mill Rd., Granville, Wis., LB, $907,870 general contract, HIGH SCHOOL,

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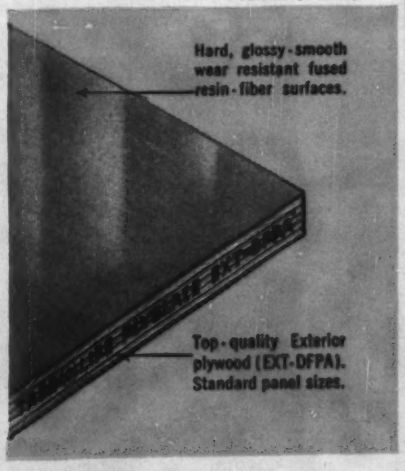
Tacoma 2, Washington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Top-quality Exterior plywood (EXT-DFPA). Standard panel sizes.

GRANVILLE, WIS. Joint Union High School Dist., 7717 W. Good Hope Rd., Milwaukee, Wis. Bids Nov. 9. CD 11/1.

▲ **O'Niel Realty,** 17800 W. Seven Mile Rd., Detroit, Mich. Owner Builds. $3,000,000. 250 brick ranch HOUSES, Chippewa, Washburn and Pembroke Sts., DETROIT, MICH.

▲ **Barton & Malow Co.,** 2631 Woodward St., Detroit, Mich. CA Est. $6,000,000. 390,000 sq. ft. PLANT, DETROIT, MICH. Thompson Products, Inc., 7881 Conant St., Detroit, Mich. CD 3/17.

▲ **Biltmore Constr. Co.,** 17613 James Couzens Hy., Detroit, Mich. CA Est. $6,000,000. 500 brick HOMES, Middlebelt Rd., GARDEN CITY, MICH. Hannan Real Estate Exchange, Inc., 16807 Grand River, Detroit, Mich.

WEST OF MISSISSIPPI

BUILDINGS—BA

▲† **Tex., Fort Hood**—HOUSING—BA 12/20—U. S. Eng., 100 W. Vickery Blvd., Fort Worth, 288-family housing units, Inv. ENG-41-443-56-45. $1,000,000. CD 7/12/51.

▲ **Tex., Port Neches**—PLANTS—Bids Asked—Goodrich-Gulf Companys, Port Neches, synthetic rubber plant expansion $1,500,000; butadiene plant expansion $1,500,000. Telletson Petrochem Instructors, c/o owners, engrs. CD 9/21.

HEAVY CONSTRUCTION—LB & CA

▲ **City,** H. Erickson, city engr., City Hall, Minneapolis, Minn., Day Labor. $2,000,000. 5 span, concrete, steel bridge over Mississippi River at Lowry Ave., MINNEAPOLIS, MINN. E. Gorgenson, City Hall, asst. city engr. in charge of bridges. CD 1/29/54.

▲ **MISSOURI**—State Hy. Dpt., Jefferson City,
Bushman Constr. Co., 4635 Wyandotte St., Kansas City, Mo., CA, $1,456,516, c. conc. 4.599 mi. Laclede Co. Bids Oct. 28, awarded Nov. 15. CD 11/7, under LB.

▲† **Charles Harris Co.,** 474 University Ave., St. Paul, Minn., CA $1,294,700, central heating plant, high temperature hot water distr. sys., Minot Air Force Base, Inv. No. 25-066-56-3, MINOT, N. D. U. S. Eng., 1709 Jackson St., Omaha 2, Neb. Bids Nov. 1. CD 11/7, under LB.

▲ **Douglas Constr. Co.,** 510 E. 15 St., Topeka, Kan. CA $1,334,592. Shunganunga Interceptor Sewer Projs. 3, 4, 5, TOPEKA, KAN. City, Topeka, Kan. CD 11/2.

BUILDINGS—LB & CA

▲ **Milton Constr. & Supply Co.,** 7567 St. Charles Rock Rd., Overland 14, Mo. CA $15,000,000. 3,000 one story, bsmnt., brick RESIDENCES, in Hathaway Manor subdivision in vicinity of 10000 Old Hall's Ferry Rd., St. Louis County, JENNINGS (ST. LOUIS 21 P.O.), MO. Vorhof-Duenke Real Estate Co., 7567 St. Charles Rock Rd., Overland 14, Mo.

▲ **Gasoline Plant Constr. Co.,** N. Esperson Bldg., Houston, Tex., CA $6,750,000, natural gas liquids extraction PLANT; CA $145,000, some gathering lines; CA $264,500, booster station, near ANDREWS, TEX. Grand total $7,159,500. Phillips Petroleum Co., City Natl. Bank Bldg., Houston, Tex. CD 5/27.

▲ **The Koppers Co., Inc.,** Industrial Rd., Houston, Tex. CA $3,375,000, design and construct sintering PLANT and ore bedding sys., HOUSTON, TEX. Sheffield Steel Corp. (Div. of Armco Steel Corp.) Industrial Rd., Houston, Tex. CD 2/13/51.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
December 7 California
STREETS AND ROADS
December 2 California

BUILDINGS—BA

▲ **Calif., Los Angeles**—FACTORY—BA 1/15—B. F. Goodrich Co., 5400 E. Olympia Blvd., two tire factory buildings with equip. $6,000,000. CD 11/15.

BUILDINGS—SLC

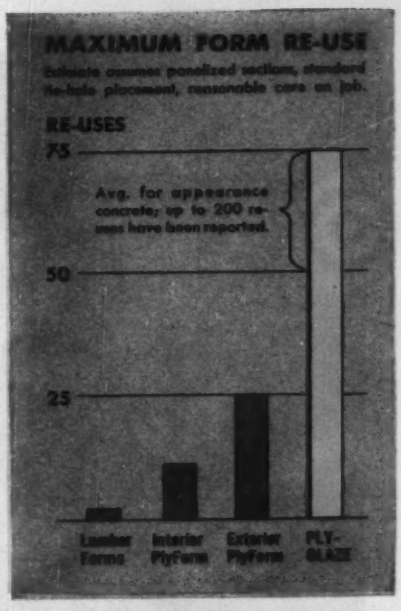
▲ **Calif., Los Angeles**—SHOPPING CENTER—Richard T. Moses, 227 S. Robertson Blvd., Beverly Hills, soon lets contract 100,000 sq. ft. shopping center, Units A, B, C, and D, 750-car parking, Tarzana. $1,000,000. W. H. Hillier, 227 S. Robertson Blvd., Beverly Hills, archt. CD 9/14.

HEAVY CONSTRUCTION—LB & CA

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,
Guy F. Atkinson Co., 10 West Orange Ave., South San Francisco, Calif., CA, $2,039,702. grading roadbed between 1.5 mi. south of San Francisco Co. line and 0.4 mi. north of Butler Rd. overcrossing, constr. 2 bridges, etc. Bayshore Freeway, San Mateo Co. Bids Oct. 26, awarded Nov. 10. CD 10/31, under LB.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento,
Lew Jones Constr. Co. & Leo F. Piazza Paving Co., 1535 S. 10 St., San Jose, Calif., CA, $1,535,052 freeway constr. 1.9 mi. U.S. 101 Bypass in San Jose incl. 5 bridges, Santa Clara Co. Bids Nov. 2. CD 11/7, under LB.

(Continued on page 141)



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The new 25-story, temblor-resistant Equitable Life Building now nearing completion in San Francisco is the first skyscraper to be built there since the enactment of that city's rigid earthquake code in 1948.

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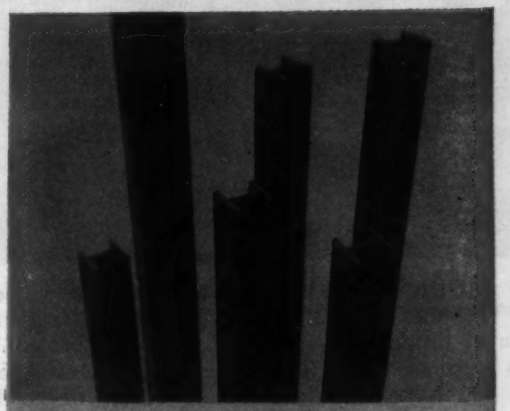
To provide the firm foundation necessary for a structure of this size, 467 USS H-Beam Bearing Piles (14 in.) were driven to refusal in hard rock, at depths ranging from 107 to 133 feet below basement level. The piles were designed for an allowable load of 135 tons.

Thus, steel again proves the answer to a city's construction problems. For it was generally believed that restrictions imposed by the code would bring an end to skyscraper construction in San Francisco.



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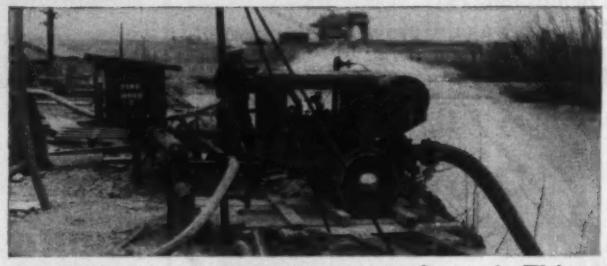
How to wash your face with Jaeger pumps

TO SCOUR THE FACE OF THE TAILRACE CUT for Virginia Electric and Power Company's power station dam at Roanoke Rapids, N. C., Stone & Webster used this ingenious set-up. Two Jaeger pumps (a self-priming 6P and high pressure 5CPH, connected in tandem) traveled in dump truck. Jets with 15/16" nozzles were handled from platforms on crawler-mounted crane. Moving along the cut, they knocked all loose rock and earth from the face with two powerful streams each shooting 370 gpm at 170 lbs. pressure. This method was also used to scour the rock before pouring wings of the dam.



EMERGENCY FIRE PROTECTION: Stone & Webster set up other Jaeger 5CPH pumps like this for standby protection against fires. Their capacity and pressure exceeds that of standard 500 gallon "pumpers".

SURE-PRIME AND HIGH PRESSURE TEAM TOGETHER: Jaeger 6P, which maintained prime automatically, was connected in tandem to a Jaeger 5CPH which boosted water pressure to 170 psi. Pumps were set up in dump truck for easy moving along job.

GENERAL VIEW OF CONSTRUCTION, Roanoke Rapids Power Station of Virginia Electric and Power Co., built by Stone & Webster Engineering Corp. Eleven Jaeger pumps were used on this job.

For full information on Jaeger dewatering and pressure pumps, see your Jaeger distributor or send for catalog P-4.

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(Continued from page 137)

BUILDINGS—LB & CA

▲ **John J. Moore Co.**, 959 33rd St., Oakland, Calif., CA, $4,000,000. design and construct SHOPPING CENTER, incl. bank, hotel, motel and stores, CONCORD, CALIF. George Cardinet & Sons, and John W. Ronayne c/o Ronayne Sales & Development Co., Concord, Calif.

▲ **William Simpson Constr. Co.**, 816 W. 5 St., Los Angeles, Calif., CA, $2,000,000. OFFICE BLDG. addn., LOS ANGELES, CALIF. Prudential Insurance Co. of America, 5757 Wilshire Blvd., Los Angeles, Calif. Bids Oct. 26. CD 10/14.

▲ **C. L. Peck**, 816 W. 5 St., Los Angeles, Calif., CA Est. over $1,000,000. 4 story OFFICE, LOS ANGELES, CALIF. New York Life Insurance Co., 51 Madison Ave., New York 10, N. Y. Bids Sept. 9. CD 8/23.

▲ **M & K Corp.**, 405 Montgomery St., San Francisco, Calif., CA, $2,866,000. Luther Burbank SCHOOL, SAN FRANCISCO, CALIF. Dpt. P. Wks., City Hall, San Francisco, Calif. Bids Nov. 2, awarded Nov. 9. CD 11/7, under LB.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
November 30 British Columbia

HEAVY CONSTRUCTION—LB & CA

▲ **McNamara Constr. Co., Ltd.**, 42 Industrial St., Leaside, Ont., CA, $2,563,065. airport work, 2 runways, taxiways, parking areas at airport, HALIFAX, N. S. Dpt. Transport, Hunter Bldg., Ottawa, Ont. Bids Nov. 4. CD 11/11, under LB.

▲ **ONTARIO**—Dpt. Hys., Parliament Bldgs., Toronto, **Runnymede Steel Constr. Ltd.**, 3382 Dundas St. W., Toronto, Ont., LB, $3,932,000 (4 bidders) Part E, Contr. 55-201, structural steel for superstructure of Burlington High-Level Bridge, Burlington. Bids Nov. 2. CD 10/7.

▲ **Westspur Pipeline Co.**, c/o Page-Hersey Tubes Ltd., 100 Church St., Toronto, Ont. Owner Builds, $6,000,000. 109 mi. 12 in. pipe line, 7 mi. 6 in. spur line and 65¼ mi. 4- to 8-in. piping for gathering system, SASKATCHEWAN

BUILDINGS—LB & CA

▲ **Burns & Dutton Concrete & Constr. Co. Ltd.**, 5440 1 St. S. W., Calgary, Alta., CA $1,801,659. (9 bidders), two 250-man BARRACK BLOCKS, one 180-man BARRACK BLOCK, one 500-man MESS, Canadian Army, Camp Sarcee, CALGARY, ALTA. Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. Bids Oct. 19, awarded Nov. 2. CD 9/28.

▲ **Marples Ridgeway Ltd.**, 759 Victoria Sq., Montreal, Que., CA Total est. $1,000,000. timber crib for FELDSPAR MINE, HAVRE ST. PIERRE, QUE. Spar-Mica Corp. Ltd., 1980 Sherbrooke St. W., Montreal, Que. C. D. Howe Co. Ltd., 1421 Atwater Ave., Montreal, engrs., CD 6/8;
Stevens Adamson Mfg. Co., Belleville, Ont., CA constr., erection boat loading sys. (Havre St. Pierre, Que.)
Canadian Erectors Ltd., 5441 Notre Dame St. W., Montreal, Que., CA mfg., erection, two 100,000 gal. oil storage tanks (Havre St. Pierre, Que.);
Dominion Structural Steel Ltd., 6894 Clanranald Ave., Montreal, Que., CA structural steel supply for storage bldg. (Havre St. Pierre, Que.);
Delphis Cote Ltd., 5550 St. Patrick St., Montreal, Que., CA placing aluminum covering for storage bldg. (Havre St. Pierre, Que.)

▲ **Modern Development, Inc.**, 437 St. James St. W., Montreal, Que., CA $5,500,000. HOUSING DEVELOPMENT, incl. 275 units, MONTREAL, QUE. Attica Builders, Inc., Milwar Construction, Inc. & Gant Constr. Co. Ltd., 437 St. James St. W., Montreal, Que.

LATIN AMERICA

HEAVY CONSTRUCTION—LB & CA

† **PANAMA**—Bureau P. Rds., Dpt. Commerce, 18 and F Sts. N.W., Wash. 25, D. C.,
Framorco S. A., Panama, LB $977,000 (5 bidders) Proj. 14, constr. 8 bridges, Inter-American Hy. program between Las Vueltas and Remedios. Bids Nov. 11. CD 10/19.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲ **Charles H. Tompkins Co.**, 907 16th St. N.W., Wash. 6, D. C., **J. A. Jones Constr. Co.**, 209 W. 4 St., Charlotte, N. C., **Tecon Corp.**, 1201 Main St., Dallas, Tex., U. S. A. and **Beton & Monierbau**, Dusseldorf, Germany, CA $32,907,000, constr. Derbend-I-Kham Dam, IRAQ. Development Bd., Ministry of Development, Baghdad, Iraq. Bids Aug. 31. CD 5/2.

FOREIGN

HEAVY CONSTRUCTION—BA

▲ **Portugal**—BA 12/20—Junta Autonoma das Estradas (Autonomous Bd. of Hys.), Lisbon, Arrabida Bridge over River Douro, from Oport to Nova de Gaia. $2,650,000. Edgar Cardosa, c/o owner, engr.

(Proposal Advertisements see pp. 149 to 152)

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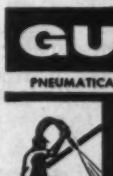

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Harvard Houses Hockey Rink For $9.45 Per Sq Ft.

For $307,357 Harvard University has built the steel-frame, concrete-block-wall, aluminum-roof building shown above around its existing Donald C. Watson Hockey Rink in Boston. George A. Fuller, Boston, is the Contractor, Shepley Bulfinch Richardson & Abbott are the architects and LeRoy Hersum is consulting engineer, also of Boston. Equipment, comprising 114 tons of refrigeration, 2 compressors—one 100 hp and one 75 hp—and the necessary piping, added $136,404 to make a total outlay of $443,761.

This 1-story building is 130 x 240 ft in size, 50 ft high at ridge, 20 ft at eaves. Its floor area is 32,512 sq ft. It is enclosing 1,166,296 cu ft and has a perimeter at first floor of 740 lin ft. Cost per sq ft is $9.45 for the building and $4.20 for the refrigeration equipment and piping, a total of $13.65.

Cost per cu ft is $0.26 and $0.12 respectively for an overall cost of $0.38 per cu ft.

How these costs are distributed is shown in the accompanying table, 21.15% of the building cost to structural steel and miscellaneous iron, 18.78% to masonry, and 12.41% to carpentry.

The foundation consists of concrete piers and grade beams with caissons at the west end.

For the superstructure rigid frame bents with no ties between columns and base give a clear span of 130 ft. The roof is corrugated aluminum on natural wood planking.

Exterior walls are concrete block with projecting piers.

Locker rooms, ticket booths, skate rooms are provided.

Heating and ventilating include installing an exhaust ventilation system for the rink area, forced hot water heating for toilets and players' rooms with necessary steam and return piping and ventilating system for toilets.

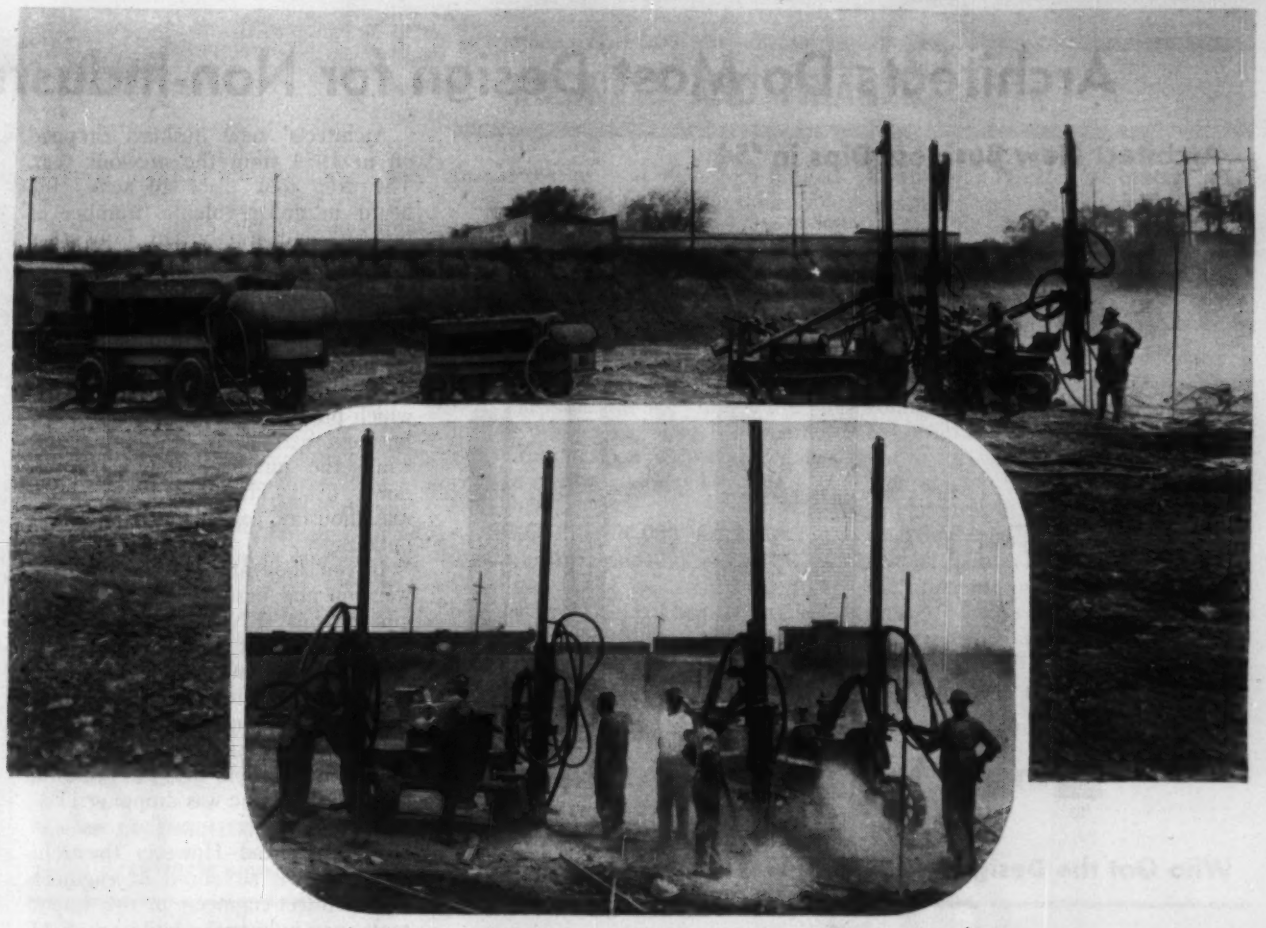
Lighting is by incandescent and fluorescent lamps.

In December 1954 prevailing wage rates included $2.75 for carpenters, $3.275 for structural iron workers, $3.20 for equipment operators, $3.53 for electrical workers, $3.39 for steam fitters and $2.50 for common laborers. These include fringe benefits.

Started: December 1954.

Items of Cost	% of Total	Summary	Unit Cost cu ft	Unit Cost sq ft
Foundation	4.75	$14,597	$0.0125	$0.449
Masonry	18.78	57,709	0.0495	1.775
Conc, reinf	2.24	6,886	0.0059	0.212
Floor finish	0.87	2,675	0.0023	0.082
Partitions & f p	1.68	5,162	0.0044	0.159
Caissons	3.23	9,930	0.0085	0.305
Plank, conc	2.23	6,857	0.0059	0.211
Water and damproofing & caulking	0.44	1,341	0.0011	0.041
Millwork	0.94	2,880	0.0025	0.089
Carpentry	12.41	38,141	0.0327	1.173
Roofing & sheet metal work	6.11	18,778	0.0161	0.578
Doors & frames, f)	0.36	1,115	0.0010	0.034
Glazing	0.09	288	0.0002	0.009
Painting	0.75	2,300	0.0020	0.071
Steel, struct & iron, misc	21.15	65.011	0.0557	2.000
Hardware	0.91	2,791	0.0024	0.086
Plumbing	3.80	11,683	0.0100	0.359
Heat & ventilator	3.80	11,067	0.0095	0.340
Vent screen, alum	0.32	992	0.0009	0.030
Electrical	6.83	20,379	0.0175	0.627
Steel, struct & reinf, e.	2.47	7,604	0.0065	0.234
Partitions, toilet, met.	0.24	734	0.0006	0.023
Sash, metal	0.23	701	0.0006	0.022
Floor, quarry tile	0.13	391	0.0003	0.012
cover, rubber	0.41	1,271	0.0011	0.039
Paving, bit conc	0.45	1,398	0.0012	0.043
Yard work & excav	4.78	14,678	0.0126	0.451
Total cost of building enclosing exist rink	100%	$307,357	$0.2635	$9.454
Rink equip incl pipe		136,404	0.1169	4.195
Total, rink & building		$443,761	$0.3804	$13.649

Time to complete: 6 months *e erect *f p fireproof



High Speed Sewage Disposal Team

Le Roi Compressors and Cleveland T-286 Mobile Drill Rigs provide flying start for Alabama project

Ordinarily you wouldn't think that air compressors and rock drills had anything to do with sewage disposal plants.

But this plant had its origin in solid bed rock — and the contractor on the job used Le Roi portables and Cleveland Mobile Drill Rigs to solve the situation.

The portables were Le Roi 600's. They were selected for their dependability and economy — which they proved by supplying 600 cfm of air — day in and day out.

The Cleveland T-286 Mobile Drill Rigs further cut costs. Basically the T-286 rig consists of a 25-hp tractor with two Cleveland patented air feeds, 4" drifters, and air-motor booms mounted on a specially-constructed front-end base. The booms swing in a 220 degree arc so that you can get any hole pattern you want. Because the T-286 gives you faster set-ups, better hole spacing, greater footage, faster drilling, greater mobility—because you can drive it anywhere and get better fragmentation — you get lower costs.

You get the whole story on Le Roi Portables and Cleveland T-286 Drill Rigs from our literature. Just write for your copies.

C-158

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Milwaukee 14, Wisconsin

PORTABLE AIR COMPRESSORS

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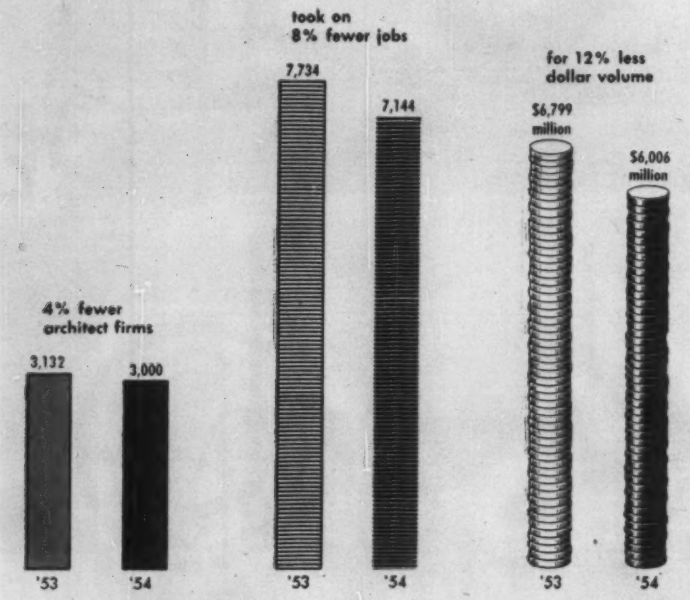
ENGINES

NATION-WIDE SALES-SERVICE NETWORK

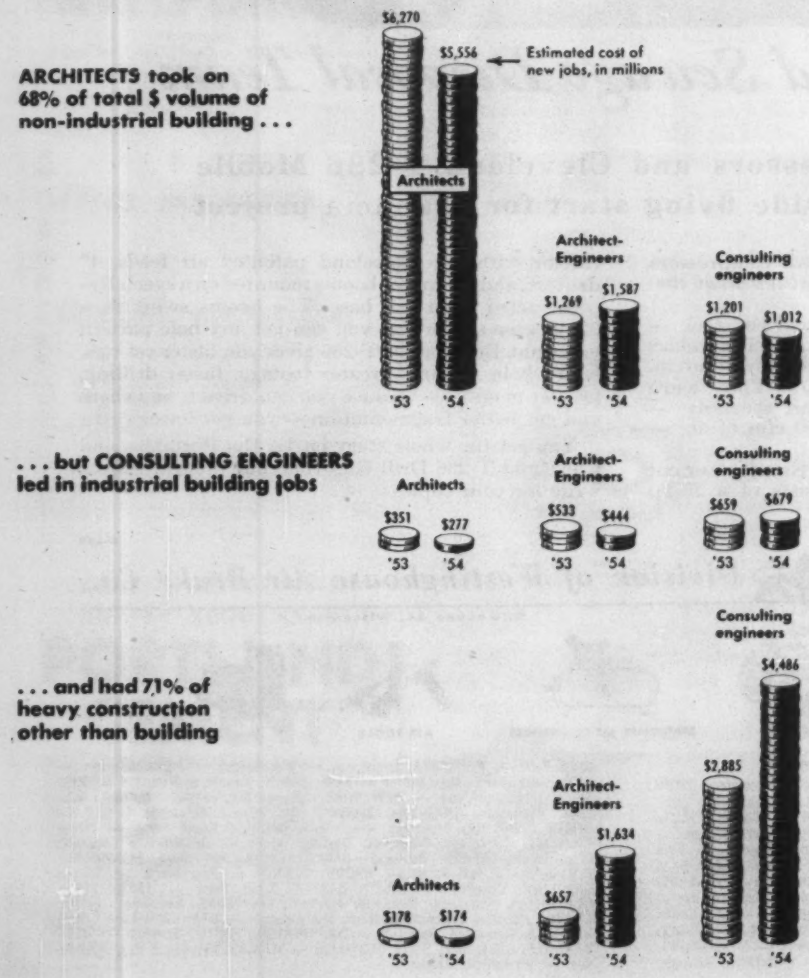
ALABAMA: Birmingham — ARIZONA: Phoenix — ARKANSAS: Harrison, Little Rock — CALIFORNIA: Bakersfield, Berkeley, Fresno, Los Angeles, Redding, San Francisco — COLORADO: Denver, Grand Junction — CONNECTICUT: Hartford — DELAWARE: Dover — FLORIDA: Jacksonville, Miami, Tampa — GEORGIA: Atlanta, Augusta — IDAHO: Boise, Idaho Falls, Sioux Falls, Twin Falls, Wallace — ILLINOIS: Chicago — INDIANA: Indianapolis, South Bend — IOWA: Cedar Rapids, Des Moines, Sioux City, Waterloo — KANSAS: Kansas City, Wichita — KENTUCKY: Lexington, Louisville, Madisonville — LOUISIANA: New Orleans, Shreveport — MAINE: Augusta — MARYLAND: Baltimore, Hyattsville — MASSACHUSETTS: Hyde Park, Worcester — MICHIGAN: Detroit, Grand Rapids — MINNESOTA: Duluth, Minneapolis — MISSISSIPPI: Jackson — MISSOURI: Joplin, St. Louis, Springfield — MONTANA: Billings, Great Falls — NEBRASKA: Lexington, Lincoln, Omaha — NEVADA: Reno — NEW HAMPSHIRE: Manchester — NEW JERSEY: Cranford, Kingston — NEW MEXICO: Albuquerque — NEW YORK: Albany, Binghamton, Buffalo, Massena, Rochester, Saugerties, Syracuse, Whitesboro, Woodside (L. I.) — NORTH CAROLINA: Charlotte — NORTH DAKOTA: Grand Forks — OHIO: Cincinnati, Cleveland, Columbus, Dayton, Toledo — OKLAHOMA: Oklahoma City, Tulsa — OREGON: Portland — PENNSYLVANIA: Harrisburg, Philadelphia, Pittsburgh, Wilkes Barre — RHODE ISLAND: E. Providence — SOUTH CAROLINA: Columbia — SOUTH DAKOTA: Sioux Falls — TENNESSEE: Chattanooga, Knoxville, Memphis, Nashville — TEXAS: Beaumont, Dallas, El Paso, Houston, Lubbock, Midland, San Antonio — UTAH: Salt Lake City — VIRGINIA: Richmond, Roanoke — WASHINGTON: Seattle, Spokane — WEST VIRGINIA: Clarksburg, South Charleston — WISCONSIN: Green Bay, Milwaukee — WYOMING: Casper.

Architects Do Most Design for Non-Industria

Architect New Business Dips in '54



Who Got the Design Work in '54?



Architects' new business dropped off in 1954 from the previous year. The drop took place all across the board—in dollar volume, number of projects, and number of firms (top chart, at left).

On a percentage basis, the biggest drop was in new industrial building, down 21% in total estimated cost of all projects and 24% in number of jobs. Other-than-industrial building, which provides the bulk of architects' business, was down 11% in volume while the number of projects was down 6%. This category includes mass housing, commercial, and public building.

If you look at ENR's report last week on new business of architect-engineer firms (ENR—Nov. 3, p. 90), you can see that last year, the architect-engineer firms gained ground on the architects when it came to non-industrial building design. The architect-engineers increased their dollar volume in this field by 25% while the architects' volume was dropping 11%.

• **Still way ahead**—However, the architects are still far ahead of engineers and architect-engineers in this important non-industrial building field. That goes for dollar volume, number of projects, and number of firms engaged. Altogether, architect firms took 68% of the total dollar volume of new business (bottom chart, at left), with architect-engineers second and engineers third.

• **Engineers lead on industrial jobs**—But consulting engineers led on industrial buildings. The engineers had nearly two and one-half times as much in dollar volume of industrial design work as that signed up by architects last year (bottom chart). In fact, engineers came up with nearly as much industrial design work as both of the other types combined. ENR reported about engineers in detail on page 102 of its Oct. 27 issue.

• **Non-building design**—As might be expected, consulting engineers got the bulk of non-building design work. Architect-engineers also got a sizeable chunk. But, as usual, design work on construction projects outside the building field accounted for a very small part of architects' new business. The total was only $174 million—less than 3% of dollar volume from all types of work. Volume in this category dropped 3%, but the number of jobs rose 4% to 366.

• **For architects**—The two major items in other-than-building projects were

airports (hangars and buildings) and unclassified projects. Airport work was up 6% in volume over 1953 to a total of $103 million. Unclassified work was down 18% to a total of $64 million. Dollar volume of other types of work, such as waterworks, sewerage, highways, and bridges, increased last year. But volume still remained very small.

• **Million-dollar firms** – Though the number of architectural firms doing at least $100,000 in new work of all types declined 4% in 1954, the number of firms doing $1 million or more in new business dipped only 2%. Of these 1,372 million-dollar firms, about 96% were active in the non-industrial building field. They signed up 4,444 projects of this type with a total estimated cost of more than $4.9 billion. This was a drop of 12% in dollar volume, 6% in number of projects. There were only 1% fewer firms in this major category than there had been in 1953.

As was the case with engineers, and architect-engineers, the million-dollar-plus firms did the bulk of the new business—though not quite as high a proportion. The big architectural firms took on 88% of the dollar volume of new business last year.

• **$500,000-$1,000,000 firms** – The firms in this group did about 7% of the total dollar of architects' new business in 1954. Their dollar volume was down 9%—less than the million-dollar firms. But the number of projects and the number of firms was down by a greater percentage than was the case for the firms in the million-dollar-plus classification. Practically all their new business was in the building field.

• **$100,000-$500,000** – The firms in this group did about 5% of total volume of new business last year. Their volume, number of projects, and number of firms were all down from 1953, but to a less extent than the two other groups.

The firms in this group did a somewhat higher percentage of their business in the non-building field than did the other two groups of architectural firms. Total volume was not very large; mostly unclassified, airports, and waterworks.

(*B&F continued on page 146*)

Architect* New Business in 1954 – By Type of Work

As reported by ENGINEERING NEWS-RECORD and CONSTRUCTION DAILY

3000 Architects signed up 7,144 new projects estimated to cost $6,006 million

Type of Work	All Architects: Number of Firms	All Architects: Number of Projects	All Architects: $ Volume Millions	Total 1954 Volume of All Types — $1,000,000 or More: Number of Firms	$1,000,000 or More: Number of Projects	$1,000,000 or More: $ Volume Millions	$500,000-$1,000,000: Number of Firms	$500,000-$1,000,000: Number of Projects	$500,000-$1,000,000: $ Volume Millions	$100,000-$500,000: Number of Firms	$100,000-$500,000: Number of Projects	$100,000-$500,000: $ Volume Millions
Building												
Industrial	562	759	276.5	235	362	196.6	101	130	35.4	226	267	44.5
Mass housing, commercial and public buildings	2,653	6,019	5,555.9	1,322	4,444	4,937.5	610	848	384.0	721	727	234.4
Total	...	6,778	5,832.4	...	4,806	5,134.1	...	978	419.4	...	994	278.9
Other Than Building												
Waterworks	14	13	$1.3	10	8	$0.4	0	0	$0.0	4	5	$0.9
Sewerage	11	13	2.6	9	11	2.4	1	1	0.1	1	1	0.1
Bridges	2	2	0.5	1	1	0.2	0	0	0.0	1	1	0.3
Highways	15	14	1.2	12	11	0.8	1	1	0.1	2	2	0.3
Earthwork, waterways	10	11	1.9	9	10	1.8	0	0	0.0	1	1	0.1
Airports	63	117	102.5	45	94	96.3	8	13	3.9	10	10	2.3
Unclassified	154	196	63.9	87	116	47.2	19	23	7.0	48	57	9.7
Total	...	366	173.9	...	251	149.1	...	38	11.1	...	77	13.7
Federal (incl. in above)	84	159	168.2	58	128	158.1	18	25	8.7	8	6	1.4
All heavy construction	3,000	7,144	6,006.3	1,372	5,057	5,283.2	655	1,018	430.5	973	1,071	292.6

How Architects' New Business in '54 Compared with '53

There were 4% fewer firms taking on new business. They had 8% fewer projects, 12% less $ volume

Type of Work	All Architects: Per Cent Change '53-'54 in ... Number of Firms %	Number of Projects %	$ Volume %	Total Volume of All Types — $1,000,000 or More: Per Cent Change '53-'54 in ... Number of Firms %	Number of Projects %	$ Volume %	$500,000-$1,000,000: Per Cent Change '53-'54 in ... Number of Firms %	Number of Projects %	$ Volume %	$100,000-$500,000: Per Cent Change '53-'54 in ... Number of Firms %	Number of Projects %	$ Volume %
Building												
Industrial	−22	−24	−21	−27	−30	−21	−20	−21	−29	−18	−17	− 5
Mass housing, commercial and public buildings	− 3	− 6	−11	− 1	− 6	−12	− 5	− 7	− 5	− 3	− 3	− 6
Total	....	− 8	−12	....	− 8	−12	....	− 9	− 8	....	− 7	− 7
Other Than Building												
Waterworks	+133	+160	+44	+100	+100	−43	0	0	0	+300	+400	+350
Sewerage	+120	+225	+ 8	+125	+267	+14	no volume in '53			0	0	−67
Bridges	−50	−33	+67	−67	−50	0	−100	−100	−100	no volume in '53		
Highways	+200	+250	+200	+300	+450	+167	−50	−50	0	no volume in '53		
Earthwork, waterways	+150	+175	+375	+200	+233	+350	0	0	0	0	0	+233
Airports	+ 3	+39	+ 6	+ 7	+49	+ 8	−27	0	−30	+25	+25	+35
Unclassified	−25	−21	−18	−20	−16	−17	−50	−16	−26	−17	−12	−13
Total	....	+ 4	− 3	....	+17	− 0.4	....	−42	−27	....	+ 1	+ 2
Federal (incl. in above)	−12	+47	− 9	− 5	+73	− 8	− 5	+14	−18	−47	−50	−52
All heavy construction	− 4	− 8	−12	− 2	− 7	−12	− 7	−11	− 9	− 6	− 6	− 7

* Not including architect-engineers who are reported separately.

Tri-State Toll Project Hinges on Future Showing of West Va. Turnpike

Turnpike authorities of West Virginia, North Carolina, and Virginia have decided to postpone further feasibility studies of the proposed Tri-State project that would extend the present West Virginia Turnpike south across Virginia to a point near Charlotte, N. C.

Key to the situation is the West Virginia Turnpike, which under the plan would also be extended north from its present terminus at Charleston to Parkersburg on the Ohio River. The existing tollroad opened last November. For the first 10 months of this year actual toll revenues have been only 53% of engineers' estimates, though they have been approaching closer to estimates. Early this week the turnpike's two bond issues were selling substantially below the offering prices—about 66 bid for the 3⅜s and 70 bid for the 4⅛s.

• **Better revenue?**—The reason the Tri-State project is being postponed rather than abandoned is the belief of traffic engineers Coverdale & Colpitts that there is "a possibility of a substantial increase in traffic and toll collections in the next few years" on the existing pike. They recommend taking a semi-annual look at the situation, starting in mid-1956.

C&C's reasoning: Projections made now of traffic and revenue for the Tri-State project must be based on today's traffic volume, which is not sufficiently encouraging for new financing. But if traffic improves on the West Virginia Turnpike, later projections for the Tri-State project would of course show a better picture.

• **Confidence**—The chairmen of the three toll authorities concerned (West Virginia Turnpike Commission, Old Dominion Turnpike Authority, and North Carolina Turnpike Authority) say this:

"We have complete confidence in the ability of our traffic engineers to accurately determine and forecast the possible flow of traffic through this corridor after sufficient time has elapsed to allow them to make such a determination."

• **Past record**—Coverdale & Colpitts, who made the original estimates, point out that the other turnpikes which have had several years' experience have shown increased revenues in their second and third year of operation.

They cite a 28.6% increase in revenue during the second year for the Maine Turnpike (tolls were increased); 18.2% for the New Jersey Turnpike; and almost 13% for Oklahoma's Turner Turnpike (whose fiscal year ends June 30). In the third year of operation, revenues of the Maine Turnpike were up 54% over the first year; and Jersey Turnpike revenues were up almost 28%.

The engineers pointed out an advantage for delay, from the standpoint of accurately estimating construction costs: "Congressional action on proposals for large federal expenditures for highway construction may resolve an existing uncertainty. . . . If such expenditures are made at the time the Tri-State Turnpike route is built . . . construction costs will be increased because contractors will generally have 'plenty of work'."

• **Truck traffic**—In explaining the West Virginia situation, the traffic engineers say there was an unexpected decrease in volume during 1954 of heavy-truck traffic in the turnpike area. This trend also showed up on the Pennsylvania Turnpike and on Ohio highways. The 1955 trend in West Virginia is hard to measure without data for the full year; but signs show it is improving.

Contractors Are Bidding Higher Now on Road Jobs

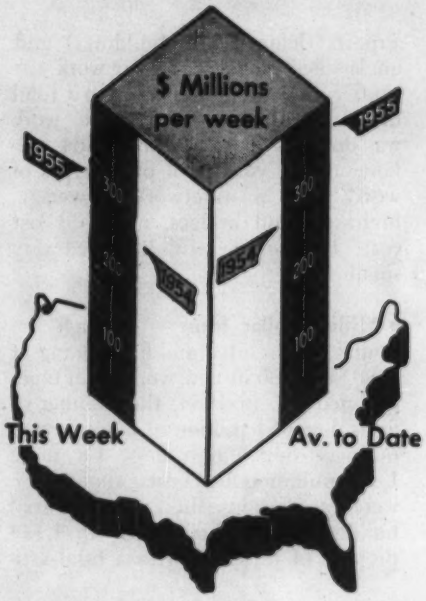
The trend is up on bidding for highway contractors. That's shown by a 3.1% rise in bid prices on federal-aid highway projects let during the third quarter. The Bureau of Public Roads composite mile price index rose to 154.0, highest point since 1953. On this index, the 1925-1929 average equals 100.

Prices increased during the third quarter for all major items included in BPR's index. Biggest was a 9.2% climb in structural steel. There was a 6.7% rise in structural concrete, and 5.4% in reinforcing steel. Concrete paving moved up 2.2%, and common excavation rose slightly.

• **Same pattern in states**—This third-quarter rise is in line with sharper rises during the second and third quarters in several western states which also keep bid indexes on highway work. South Dakota and Colorado reported jumps of 9.6% and 13.7% in the third quarter.

Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

(millions of dollars)	This Week	Cumulative 47 wks 1955	1954	% chge
By Ownership				
Federal	$16.2	$1,529.7	$1,171.6	+31
State and municipal	73.0	4,748.3	4,500.7	+6
Total public	89.2	6,278.0	5,672.3	+11
Total private	216.3	10,750.8	7,366.2	+46
U. S. Total	$305.5	$17,028.8	$13,038.5	+31
By type of work				
Waterworks	$2.3	$243.0	$219.8	+11
Sewerage	4.7	351.6	357.8	−2
Bridges	10.3	443.2	459.3	−4
Highways	29.2	1,939.2	1,729.5	+12
Earthwork, waterways	2.9	493.1	287.9	+71
Buildings:				
Public, excl. hsg.	18.7	1,548.9	1,593.2	−3
Public housg.	0.5	239.8	240.9	−0.4
Private housg.	103.0	5,698.6	3,868.7	+47
Commercial	35.1	1,548.5	1,271.8	+22
Industrial	76.0	2,640.8	1,701.8	+55
Unclassified	22.8	1,882.1	1,307.8	+44
U. S. Total	$305.5	$17,028.8	$13,038.5	+31

NOTE: Minimum size projects included are: Waterworks and waterways, $44,000; other public works, $73,000; industrial buildings, $93,000; other buildings, $344,000.

New capital for construction

(millions of dollars)	Week of Nov. 17	Cumulative 46 Wks 1955	% Chge '54-'55
Corporate securities	$114.3	$3,230.7	+30
State and municipal:			
All except housing	74.1	4,189.3	−15
Housing	...	93.0	+2
Federal loans	0.6	120.7	+13
Federal aid	...	853.5	+27
Total nonfederal	$189.0	$8,487.3	+3
Federal appropriations:			
In U. S.	...	$3,379.7	+63
Outside U. S.	...	84.6	+155
Total new capital	$189.0	$11,951.6	+15

ENR cost and volume indexes, 1955

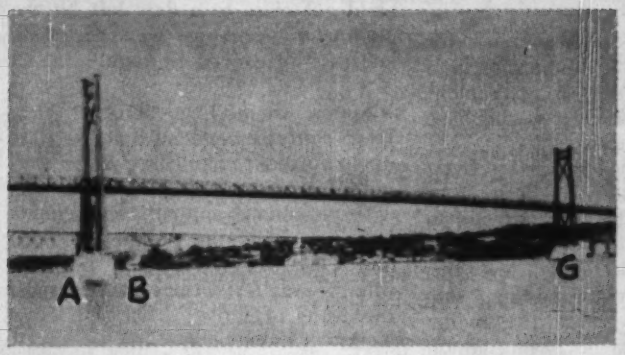
		Base years = 100 1913	1926	1949
Construction cost	11/17	672.76	323.40	141.03
	11/13†	673.20	323.61	141.13
Building cost	11/17	478.86	258.86	136.12
	11/3†	479.30	259.10	136.25
Volume	Oct.	628	255	182
	Sept.	576	234	166

† Official Indexes for Nov.

Longyear

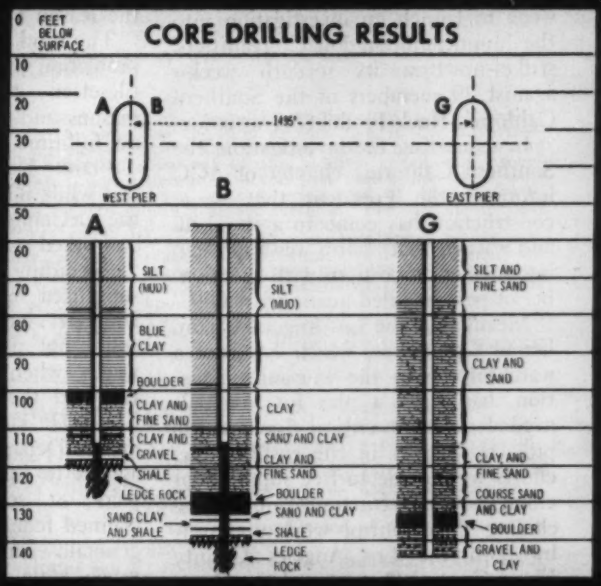
Our test drilling services span the years... span the continent!

From the Hudson River



Test borings for piers, anchorage sites and approaches of MID-HUDSON BRIDGE, Poughkeepsie, New York.

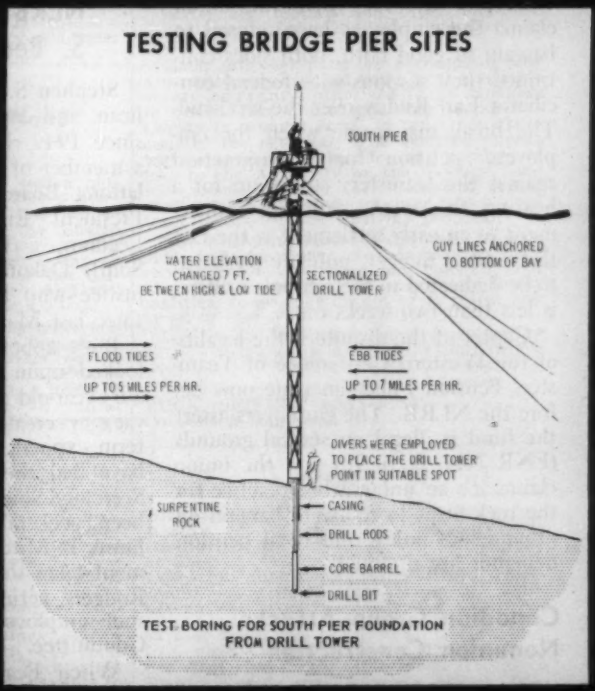
The E. J. Longyear Co. diamond drilled 20 holes for a total of 2377 feet on the river and on land. The drilling disclosed deep, soft ground on the river bottom, which led to the use of open caissons for pier foundations. The bridge is 3,000 feet long between anchorages, with a main span of 1495 feet between centers of the towers.



. . . to the Golden Gate

Test borings for piers and anchorage site of GOLDEN GATE BRIDGE, San Francisco, California.

- A total of 16 holes, ranging in depth from 15 to 141 feet was drilled in 90 days.
- Three holes were sunk at the Fort Point anchorage site, six at the South Pier site, four at the North Pier site and three at the Marin Anchorage site.
- Cores 2" in diameter were recovered, revealing serpentine formations as foundation for the south pier, and compact greenstone or diabase as foundation for the north pier.
- The work was carried out during winter months under extremely severe and difficult conditions.


TESTING BRIDGE PIER SITES
SOUTH PIER
WATER ELEVATION CHANGED 7 FT. BETWEEN HIGH & LOW TIDE
SECTIONALIZED DRILL TOWER
GUY LINES ANCHORED TO BOTTOM OF BAY
FLOOD TIDES
UP TO 5 MILES PER HR.
EBB TIDES
UP TO 7 MILES PER HR.
DIVERS WERE EMPLOYED TO PLACE THE DRILL TOWER POINT IN SUITABLE SPOT
SURPENTINE ROCK
CASING
DRILL RODS
CORE BARREL
DRILL BIT
TEST BORING FOR SOUTH PIER FOUNDATION FROM DRILL TOWER

E. J. Longyear Co. MINNEAPOLIS, MINN. · CABLE LONGCO
CANADIAN LONGYEAR LTD., NORTH BAY, ONTARIO · LONGYEAR ET CIE., PARIS, FRANCE

No Break in sight

Contractors ask President Eisenhower to investigate western teamsters' strike

President Eisenhower was asked last week to launch an investigation into the multi-million-dollar teamsters' strike—now in its seventh week—against 29 members of the Southern California Rock Products Association.

In requesting the investigation, the Southern California chapter of AGC informed the President that major construction has come to a standstill and warned that "harm was approaching disaster proportions with the number of persons idled nearing 100,000."

Meanwhile, the Los Angeles Chamber of Commerce, which has kept a watchful eye on the worsening situation, has made a plea for materials needed on eight critical flood-control projects. Earlier in the costly strike, efforts were made to free supplies for emergency construction projects—including flood-control work underway by both the Los Angeles County Flood Control District and the Corps of Engineers—but the efforts were largely unsuccessful because the union and rock producers found it easier to agree on policy than on procedure.

Despite the fact that the union claims the employers have refused to bargain in good faith, both sides continued their sessions with federal conciliator Earl Ruddy over the weekend. The break may come when the employers' petition for an injunction against the teamsters comes up for a hearing this week. Another inducement to an early settlement is the fact that labor's merger, publicly professed to be dedicated to the nation's welfare, is less than two weeks off.

Center of the dispute is the legality of the Western Conference of Teamsters Pension Fund—an issue now before the NLRB. The employers assert the fund is illegal on several grounds (ENR Nov. 3, p. 98) and the union claims it's an unfair labor practice for the rock firms to refuse to bargain on other issues unless and until pension demands are dropped.

Canadian Group Attacks Nonunion Construction

Designed primarily to protect smaller building trades unions, a $9,000-a-year "fighting fund" to combat nonunion construction in British Columbia is scheduled to be set up by the Vancouver Building Trades Council (AFL).

The 38 unions that constitute the council will finance the fund by paying 2¢ a month for each of their 35,000 members. Increased activity by nonunion firms was reported as the reason for the action.

The fund will be used primarily for protection of smaller unions such as tilesetters, terazzo workers, cement masons and marble setters who have no full-time business agents.

Frank Kennedy, BTC secretary, said while BTC had fixed the amount, the mechanics of the plan are still to be worked out.

According to Kennedy, low bids submitted recently for building subcontracts had revealed "the bidder could not possibly be paying union wages when the other firms had trimmed their profits to as little as 2%." He said the provincial government's Department of Education had agreed to insist that union rates be paid on school construction but claimed federal government contracts generally permit use of a minimum wage scale lower than prevailing union rates.

Back on the Track

NLRB appointments go to S. Bean and B. Leedom

Stephen S. Bean, a Boston Republican and an NLRB trial examiner since 1949, last week was appointed a member of the National Labor Relations Board. At the same time, President Eisenhower named Boyd Leedom, a Republican and former South Dakota State Supreme Court justice who has been on the board since last March, as chairman.

Both appointments were generally looked upon as compromises. Bean, a 63-year-old attorney who will fill the vacancy created when Guy Farmer's term expired last August, was said to have had the support of Commerce Secretary Sinclair Weeks and to have been acceptable to Labor Secretary James P. Mitchell. Leedom's appointment takes the gavel from Philip Ray Rodgers, acting chairman and former staff employe of the Senate Labor Committee.

When Bean's appointment is approved by the Senate, the five-man board will have three Republican members, all appointed by Eisenhower: Bean, Rodgers and Leedom.

Labor Briefs . . .

• **Big settlement**—A Pennsylvania court has approved a $97,500 settlement by a Pittsburgh contracting firm to the family of a youngster who was seriously burned at a construction site. Playing in an excavated ditch, the child got close to a flare left by the contractor when pipe he expected to lay had not arrived by nightfall.

• **Almost there**—The ruling of New Jersey's attorney general that the state unemployment compensation law permits integration of jobless benefits with guaranteed annual wage benefits brings to 65% the number of Ford and GM workers covered by such rulings—only 66⅔% is needed to make the plans operative. Michigan, New York, Connecticut, Massachusetts and Delaware have already given the green light.

• **Won't guess**—Speaking this month before the American Society for Personnel Administration, NLRB General Counsel T. C. Kammholz said he won't restrictively exercise his discretion over issuance of complaints when charges are filed. Where "close or novel issues of law or policy are involved", the case will be sent to the board for decision.

• **For 1956**—As part of its 1956 state legislative program, the New York State CIO Council will plug for a comprehensive state health insurance program financed by a payroll tax. Higher unemployment, workmen's compensation and disability benefits, and repeal of the current merit rating formula for job insurance taxes will be pushed.

• **Good point**—Speaking at the Fifth Annual Ohio Apprenticeship Conference, D. Whitlock of the Structural Clay Products Institute urged the construction industry to keep apprenticeship a free, voluntary program, conducted by management and labor. "Restrictive practices by industry, labor or government," he said, "will hinder rather than aid apprenticeship".

• **Union funds**—The legislative study commission established in Massachusetts to investigate union health and welfare funds has asked for more time. In an interim report, it says that "glaring instances of an utter lack of protection for the working man and his family places the security of thousands . . . in jeopardy."

OFFICIAL PROPOSALS

Bids: December 8, 1955

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., Eastern standard time on the 8th day of December, 1955, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

Contract No.	County	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 4, B. F. PERRY, Acting District Engineer, Barge Canal Terminal, Rochester 1, N. Y.						
FAC 55-17	Monroe	Rochester City: Inner Loop (South Ave. to George St.). (Contract #2). Project No. U-231(8)	0.48	Demolition and Misc. Work	$9,000 Plans $10	$174,000
DISTRICT No. 5, E. G. H. YOUNGMANN, District Engineer, 65 Court St., Buffalo, N. Y.						
FGRC 55-89	Cattaraugus	Gowanda Village, S.H. 1024; Gowanda-Dayton, S.H. 958; Project No. FG-670(2)	0.20	Two Crse. Cem. Conc. Pavt.=0.19 Mi. Misc. Work=0.01 Mi. R.R. Sep. Pl. Gir. 140'	$28,000 Plans $15	505,000
DISTRICT No. 8, J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
FERC 55-95	Orange	Port Jervis-Sullivan County Line, Pt. 1, S. H. 412 Project No. ER-18(1)	1.65	9" Cem. Conc. Pavt. 24' Wide = 1.58 Mi. Misc. Work=0.07 Mi.	$40,000 Plans $15	744,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

JOHN W. JOHNSON
SUPT. OF PUBLIC WORKS

Bids: December 15, 1955

Fairfax County, Virginia Integrated Sewerage System

(Advertisement for Bids)

Sealed bids will be received at the Office of the Sanitary Engineer, County of Fairfax, Fairfax, Virginia, until Thursday, December 15, 1955 at 2:00 P.M. E.S.T. for the construction of Contract No. 41: Approximately 83,000 lin. ft. of 8 to 18-inch sanitary sewers and appurtenances. Plans and contract documents may be examined and copies thereof obtained at the Office of the Sanitary Engineer, upon payment of $10.00 per set, which shall not be returnable. Checks should be made payable to Director of Finance. Contractors, whether resident or non-resident in Virginia, will be required to show evidence of a Certificate of Registration as required by Chapter 7 of Title 54 of the Code of Virginia before their bids will be considered. Each bid must be accompanied by cash, certified check, or by an acceptable bidder's bond in an amount not less than 5% of the amount of the total bid. The successful bidder will be required to furnish a performance and maintenance bond in a penal sum equal to the full contract price. No bid may be withdrawn for a period of 30 days after the opening thereof and the right is reserved to waive any informality therein and to reject any or all bids.

Dated: November 16, 1955

Harry L. Hale
Sanitary Engineer

Bids: December 19, 1955

Fairfax County, Virginia Integrated Sewerage System

(Advertisement for Bids)

CONSTRUCTION OF A SEWAGE TREATMENT PLANT

Sealed bids will be received at the Office of the Sanitary Engineer, County of Fairfax, Fairfax, Virginia, until Monday, December 19, 1955 at 2:00 P.M., E.S.T. for the construction of: Contract No. 46: A primary sewage treatment plant with an initial capacity of 0.75 M.G.D. Copies of the plans and specifications may be examined without charge at: Alexander Potter Associates, New York; R. Stuart Royer Associates, Richmond, Va.; Associated General Contractors, Charlotte, Greensboro and Raleigh, N. C. and Columbia, S. C.; Builders Exchange Inc., Richmond, Va.; Builders & Contractors Exchange, Norfolk, Va. Plans and contract documents may be examined and copies thereof obtained at the Office of the Sanitary Engineer, upon payment of $15.00 per set, which shall not be returnable. Checks should be made payable to Director of Finance. Contractors, whether resident or non-resident in Virginia, will be required to show evidence of a Certificate of Registration as required by Chapter 7 of Title 54 of the Code of Virginia before their bids will be considered. Each bid must be accompanied by cash, certified check, or by an acceptable bidder's bond in an amount not less than 5% of the amount of the total bid. The successful bidder will be required to furnish a performance and maintenance bond in a penal sum equal to the full contract price. No bid may be withdrawn for a period of 30 days after the opening thereof and the right is reserved to waive any informality therein and to reject any or all bids.

Dated: November 15, 1955

Harry L. Hale
Sanitary Engineer

Bids: December 8, 1955

Sewage Treatment Plant

ADVERTISEMENT

Notice is hereby given that sealed bids for SECTION H of the Puerto Nuevo Sewage Treatment Plant will be received in accordance with the law by the Puerto Rico Aqueduct and Sewer Authority until 3:00 o'clock P. M. on the eighth day of December, 1955, at the office of the Authority in Santurce, Puerto Rico, and will then be publicly opened and read.

The work comprises furnishing materials and performing the labor for the furnishing and installation of the electrical equipment, controls and wiring for the Puerto Nuevo Sewage Treatment Plant, a primary sewage treatment plant with an initial capacity of twenty-four (24) million gallons per day.

Copies of the plans and specifications may be examined without charge at the office of the Puerto Rico Aqueduct and Sewer Authority, Santurce, Puerto Rico, or at the offices of Buck, Seifert and Jost, Consulting Engineers, 223 Manuel V. Domenech, Street, Hato Rey, Puerto Rico and 112 East 19th Street, New York 3, New York. Copies thereof may be obtained at the office of the Treasurer of the Puerto Rico Aqueduct and Sewer Authority, Stop 26½, Fernandez Juncos Avenue, Santurce, Puerto Rico or at the office of Buck, Seifert and Jost, Consulting Engineers, 112 East 19th Street, New York 3, New York, upon deposit of cash or certified check payable to the Puerto Rico Aqueduct and Sewer Authority in the amount of Fifty ($50.00) Dollars, which sum will be refunded upon return of the plans and specifications in good condition within twenty (20) days after the date on which bids are received or else the entire deposit will be forfeited.

Bids will be received only from persons who have requested the plans and specifications and made the required deposit therefore under their own names. These documents cannot be obtained later than December 6th, 1955.

The principal items of work included in SECTION H are:

Substation of two thousand (2,000) KVA capacity.

Switchgear, control centers, panelboards, transformers and other electrical equipment.

Power, light, control and gauge circuits, wiring, conduit and accessories, lighting fixtures, battery sets, grounding and other equipment and accessories.

Wiring, conduit, connections and accessories for motors and other electrical equipment furnished and installed by others.

Each proposal must be accompanied by a certified check or bid bond from a reliable surety company authorized to do business in Puerto Rico and satisfactory to the Authority in amount equal to ten (10%) percent of the proposal. The certified checks will be retained to pay for any damage or loss to the Authority or the liability bond will accrue in case the successful bidder shall neglect or refuse to enter into a contract in accordance with his proposal.

The Authority reserves the right to consider bids for thirty (30) days after their receipt before awarding any contract and the right is reserved to waive any informalities, to accept any bid or to reject any or all of them.

PUERTO RICO AQUEDUCT AND SEWER AUTHORITY
By RAFAEL V. URRUTIA
Executive Director

BUCK, SEIFERT AND JOST
Consulting Engineers

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4567) will be received at Denver, Colorado, until December 15, 1955, for furnishing motor-driven, horizontal, centrifugal-type pumping units having the following capacities under the total heads stated: two units, 39 cfs each, 83 foot head; two units, 21.5 cfs each, 151 foot head; and four units, 33 cfs each, 222 foot head, for Evergreen Pumping Plant, West Canal Laterals (Block 77), Columbia Basin Project, Washington. Delivery is desired within 330 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

OFFICIAL PROPOSALS

Bids: December 1, 1955

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on the 1st. day of December 1955, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

Contract No.	County	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 2, Lacy Ketchum, District Engineer, 109 North Genesee Street, Utica, N. Y.						
M.T. 55-11	Montgomery	New York State Thruway Mohawk Section—Subd. 14 Alteration to Pedestrian Underpass	0.13	Asphalt Conc., Opt.	$500 Plans $10	$10,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, 65 Court Street, Buffalo, N. Y.						
E.T. 55-13 S.T. 55-15	Chautauqua	New York State Thruway—Erie Section, Subd. E5 (Rte. 20 to 4 Mi. Level Road) The Rte. 5 and 20 Interchange & Service, Access and Crass Roads	3.60	9" Two Crse. Cem. Conc. Pavt. Var. Wide=2.86 Mi. Cem. Conc. Pavt.=0.10 Mi. Asph. Conc., Cpt.=0.51 Mi. Misc. Work=0.13 Mi. 2 Hy. Seps. Comp. I-Beams 159.5' & 205.5'	$65,000 Plans $25	$1,174,000
E.T. 55-14 S.T. 55-16	Erie	New York State Thruway—Erie Section, Subd. E-7A (Evans Ctr.—Eden Rd. to Camp Rd.) & Service & Cross Rds.	8.03 (3.08) (Acc.)	9" Two Crse.Cem. Conc. Pavt. 2@ 25' Wide=7.95 Mi. Asp. Conc., Opt.=3.08 Mi. Misc. Work=0.08 Mi. 6 Hy Grade Seps. Comp. I-Beam, 2 @ 162', 1 @ 350.6', 2@ 212.3', 1@ 252.2'	$230,000 Plans $50	4,216,000
DISTRICT No. 8, J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
TSP RC 55-1	Columbia & Dutchess	Taconic State Parkway, Section 7, Pts. 3 & 8, Section 9A, Pts. 1 & 2 & Section 9B, Pt. 1	12.29	Washout Repairt & Misc. Work	$4,000 Plans $10	73,000
DISTRICT No. 10, M. E. Goul, District Engineer, Mantauk Highway at Little East Neck Road, Babylon, L. I., N. Y.						
PSC 7278 8966	Nassau	Eliminations of Grade Crossings of the Long Island Railroad with Various Streets in Hamlet of Baldwin and Village of Freeport	0.34 (1.56) (R.R.)	Railroad Relocation=1.56 Mi. Asph. Conc., Opt.=0.25 Mi. Cem. Conc. Pavt.=0.09 Mi. 4 Plate Girders 80', 85.5', 69' and 76.5' 1 Viaduct and Station 920'	$182,000 Plans $100	3,415,000
DISTRICT No. 8, J. S. Bixby, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.						
H.T. 55-10 C.T. 55-14	Rockland	New York State Thruway—Hudson Section, Subd. 8, Pts. I, II and III (Suffern to Nyack) and Catskill Sect., Sub. 7 (Suffern to Harriman, Pt. 2)		Furnish and Install 26,250 L.F. Chain Link Fence and 37,500 L.F. Woven Wire Fence	$10,000 Plans $10	$186,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Laws, as set forth in "Instructions to Bidders."

The right is reserved to reject any or all bids.

SUPT. OF PUBLIC WORKS
JOHN W. JOHNSON

Bids: December 6, 1955

Power Authority of The State of New York

ST. LAWRENCE POWER PROJECT
ADVERTISEMENT FOR PROPOSALS
FOR
THE FURNISHING AND DELIVERY OF EMERGENCY DIESEL-GENERATOR SET AND APPURTENANCES
SPECIFICATIONS NO. PA-5-14027
ST. LAWRENCE CONTRACT NO. P26

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the design, manufacture, and furnishing of one (1) stationary emergency diesel-generator set and appurtenances and delivery thereof f.o.b. cars at destination, in the following ways:

(1) If brought in person on the day of receiving bids, until 2:30 P.M. Eastern Standard Time on the 6th day of December, 1955, Hearing Room C on the 6th floor, 270 Broadway, New York, New York.

(2) If mailed in, until 2:15 P.M. Eastern Standard Time on the 6th day of December, 1955, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above. Bids will be entertained for the emergency diesel-generator set, appurtenances and services in accordance with the bidding schedule. Erection at the site of installation will be done by Others but services of erecting engineers shall be provided by the manufacturer if and when required. Delivery of the diesel-generator set will be required by April 1, 1956.

Plans, Specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, may be inspected by prospective bidders during office hours, and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York upon application and prepayment of a fee of Ten ($10.00) dollars per initial set of contract documents and Five ($5.00) dollars per set for additional sets, no part of which will be refunded. Two sets must be returned with each bid.

Bids will not be restricted to American manufacturers.

Bids must be made in duplicate upon the proposal forms included in and bound with the Contract Documents. A bid deposit will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

PA-5-14027
11/10/55

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4483) will be received at Denver, Colorado, until January 4, 1956, for furnishing and installing two 13,333-kva, 6,900-volt, 180-rpm, 3-phase, 60-cycle, vertical-shaft, alternating-current generators for Glendo Power Plant, Missouri River Basin Project, Wyoming. Location near Glendo, Wyoming. Completion time 500 days for first unit and 590 days for second unit; and the time for installation will be 120 days for each unit after date of receipt of notice to proceed with the installation of each unit. For particulars, address Bureau of Reclamation, P. O. Box 127, Glendo, Wyoming; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4561) will be received at Denver, Colorado, until January 4, 1956, for furnishing and installing one 11,250-kilowatt, 6,900-volt, 3-phase, 95 percent power factor, 225-rpm, 60-cycle, vertical-shaft, alternating-current, air-cooled generator for Roza Power Plant, Yakima Project, Washington. Location near Yakima, Washington. Completion time 550 days for shipment and 120 days for installation. For particulars, address Bureau of Reclamation, P. O. Box 937, Boise, Idaho; P. O. Box 516, Kennewick, Washington; or Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

U. S. Government

United States Department of Commerce, Bureau of Public Roads, November 10, 1955. SEALED BIDS will be received at the office of the Bureau of Public Roads, Room 4009, General Services Building, Washington 25, D. C., until 2:00 p.m., e.s.t., December 15, 1955, for construction of Inter-American Highway Projects 75-56-3A (Roadway) and Project 75-56-3B (Bridges), in the Republic of Costa Rica, between San Ramon and the northern border of Costa Rica. Bidders may submit bids on following alternate basis: Alternate "A" for Roadway items only; Alternate "B" for Bridge items only; Alternate "C" for Roadway and Bridge Items combined on all-or-none basis. The approximate quantities of the more important work are: ROADWAY: 640,000 cubic meters Roadway Excavation; 445,000 tons Crushed Gravel or Stone Base Course; 1,066,000 square meters Reconstructed Base Course; 1,460,000 square meters Asphalt Road Mix Surface; 11,700 tons cut-back asphalt. BRIDGES: 7,700 cubic yards Structure Excavation; 6,800 cubic yards Class "A" Concrete; 316 tons Reinforcing Steel furnish and place; 198 tons Reinforcing Steel-place only; 436 tons Structural Steel furnish and erect; 398 tons Structural Steel erect only; 1,200 lineal feet timber foundation piling. Special conditions of work performed by U. S. Government in foreign areas apply as well as local laws. Plans, Specifications and Proposal Forms are available upon request at the address given above, or Bureau of Public Roads, Fifth Floor, Gran Hotel Costa Rica, San Jose, Costa Rica. C. D. Curtiss, Commissioner.

OFFICIAL PROPOSAL

RATE: $1.80 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Bids: December 8, 1955

Power Authority of the State of New York Advertisement For Proposals

FOR
CHANNEL IMPROVEMENTS
SPARROWHAWK-TOUSSAINTS
CHANNEL
NEAR OGDENSBURG, ST. LAWRENCE
COUNTY, NEW YORK
SPECIFICATIONS NO. PA-5-11007
ST. LAWRENCE CONTRACT NO. 22

NOTICE TO CONTRACTORS: The POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the Channel Improvements at Sparrowhawk Point and Toussaints Island near Ogdensburg, St. Lawrence County, New York in the following ways:

(1) If brought in person on the day of receiving bids until 10:30 A. M. Eastern Standard Time on the 8th day of December, 1955, 270 Broadway, Hearing Room C on the 6th Floor, New York, New York.

(2) If mailed in until 10:15 A. M. Eastern Standard Time on the 8th day of December, 1955, at the Authority's office, 270 Broadway, Room 1300, New York 7, New York.

The proposals will be publicly opened and read aloud at the time and at the address given in (1) above.

The principal items of work are: Estimated:

12,288,000 cu. yds. Excavation, Common
41,000 cu. yds. Excavation, Rock

The work shall be completed on or before June 1, 1958.

Plans, specifications and Proposal Forms for the work will be on file in the Authority's office and in the offices of the Engineer, Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts, and the Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, may be inspected by prospective bidders during office hours and may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and prepayment of a fee of Ten ($10.00) dollars per initial set and Five ($5.00) dollars per set for additional sets, no part of which will be refunded.

Bids will not be restricted to American contractors. However, dredges and other marine plant shall be registered and built in the United States.

Bids must be made in duplicate in accordance with instructions contained in the Information for Bidders. Guarantee will be required with each bid in an amount not less than 10 percent of the gross sum bid.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

Bids: December 14, 1955

Construction of Freeway

STATE OF RHODE ISLAND AND
PROVIDENCE PLANTATIONS
DEPARTMENT OF ADMINISTRATION
DIVISION OF PURCHASES
NOTICE TO ROAD AND BRIDGE
CONTRACTORS

Sealed Proposals addressed to the Division of Purchases and enclosed in an envelope endorsed "Proposal for the Construction of the North-South Freeway, Construction Contract Three-Four, Freeway over the Providence River to Hayward Park Area" will be received by the Division of Purchases at the office of the State Purchasing Agent, Room 123, State House, Smith St., Providence, R. I., until 11:30 A.M. (EST) on the 14th day of December, 1955, at which time they will be opened and read in public:

R. I. Contract No. 5553, F. A. Projects No. IN-03(5) and UI-03(6), Construction Contract Three-Four, North-South Freeway Over the Providence River to the Hayward Park Area. This contract involves approximately 20,478 cubic yards of excavation; 142,083 cubic yards of common borrow; 10,454 cubic yards of selected borrow, Type "A"; 35,723 square yards of cement concrete base course with crack control; 36,201 square yards of asphaltic concrete pavement, Type "I-1"; 23,886 square yards of sheet asphalt pavement, Type "J-1"; 89,178 linear feet of foundation piles; 17,673 square feet of stone masonry veneer; 16,389 cubic yards of structure concrete masonry; 4354 tons of structural steel and 1261 tons of reinforcement bars.

Bids for the above work must be made on blanks furnished by the Department of Public Works, Division of Roads and Bridges. Plans and specifications and special provisions may be examined at Room 123 State House, or 232 State Office Building, Providence, R. I., on and after Wednesday, November 30, 1955, every week day except Saturdays and holidays between the hours of 8:30 A.M. and 4:30 P.M. (EST). Blanks for submitting proposals may be obtained through the office of the State Purchasing Agent at 123 State House. A deposit of $200.00 shall be made for each set of documents, which will be refunded if plans and specifications are returned in good condition within two weeks after the opening of bids.

A certified check or bid bond payable to the State of Rhode Island, or cash, in the amount of $130,000.00 must be furnished by each bidder, which proposal guaranty will be returned after the contract has been executed, unless forfeited in accordance with the stipulations in the proposal.

A performance bond of one hundred (100) percent of the contract price with a satisfactory surety company will be required of the successful bidder. The Division of Purchases reserves the right to reject any or all bids.

FEDERAL REQUIRED SPECIAL PROVISIONS: The attention of prospective Bidders is called to the fact that this project is to be bid upon and the contract executed under the Rules and Regulations for carrying out the provisions of the Federal-aid Highway Act of 1954 and the Special Provisions, dated October 12, 1954, as amended and supplemented, as required by the Department of Commerce, Bureau of Public Roads.

WAGES OF LABOR: Chapter 290 of the General Laws, 1938, as amended, requires that "the contractor to whom the contract is awarded and any sub-contractor under him shall have ordinarily paid the prevailing rate of per diem wages and shall continue to pay the prevailing rate of per diem wages and the general prevailing rate for regular, holiday, overtime and other working conditions to all workmen needed to execute the contract or work."

Such a schedule of prevailing wage rates of per diem wages in the locality in which the work is to be performed for each craft, mechanic, teamster, laborer or type of workman needed to execute the contract or work has been established on a minimum hourly basis and is on file in the office of the State Department of Labor. The contractor shall pay not less than the said minimum hourly wage rates and not less than the general prevailing rate for holiday, overtime and other working conditions.

On State, City and Town projects, Chapter 291 of the General Laws of 1938, as amended, requires that Rhode Island citizens be given preference in employment.

SUBLETTING OR ASSIGNING THE CONTRACT: The attention of Bidders is directed to the Standard Specifications and Special Provisions covering subletting or assigning the Contract.

DEPARTMENT OF ADMINISTRATION,
DIVISION OF PURCHASES
By: Joseph L. Byron
State Purchasing Agent.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4570) will be received at Denver, Colorado, until December 27, 1955, for furnishing three 100,000-pound capacity, radial-gate hoists for Palo Verde Diversion Dam, Palo Verde Diversion Project, Arizona-California. Delivery is desired within 360 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-4568) will be received at Denver, Colorado, until December 22, 1955, for furnishing one 60-ton, single trolley, motor-operated traveling crane for Roza Power Plant, Yakima Project, Washington. Delivery is desired within 330 days. For particulars, address Bureau of Reclamation, Building 53, Denver Federal Center, Denver 2, Colorado. W. A. Dexheimer, Commissioner.

Bids: December 19, 1955

Fairfax County, Virginia Integrated Sewerage System

(Advertisement for Bids)

Sealed bids will be received at the Office of the Sanitary Engineer, County of Fairfax, Fairfax, Virginia, until Monday, December 19, 1955 at 2:00 P. M. E.S.T. for the construction of Contract No. 37-D: Approximately 8500 lin. ft. of 18 to 27-inch sanitary sewers and appurtenances. Plans and contract documents may be examined and copies thereof obtained at the Office of the Sanitary Engineer, upon payment of $10.00 per set, which shall not be returnable. Checks should be made payable to Director of Finance. Contractors, whether resident or non-resident in Virginia, will be required to show evidence of a Certificate of Registration as required by Chapter 7 of Title 54 of the Code of Virginia before their bids will be considered. Each bid must be accompanied by cash, certificate check, or by an acceptable bidder's bond in an amount not less than 5% of the amount of the total bid. The successful bidder will be required to furnish a performance and maintenance bond in a penal sum equal to the full contract price. No bid may be withdrawn for a period of 30 days after the opening thereof and the right is reserved to waive any informality therein and to reject any or all bids.

Dated: November 16, 1955

Harry L. Hale
Sanitary Engineer

Bids: November 29, 1955

The Hydro-Electric Power Commission of Ontario

ST. LAWRENCE POWER PROJECT
CANADIAN NATIONAL RAILWAYS
RELOCATION STEEL RAILWAY
BRIDGES

SEALED TENDERS, in quadruplicate, addressed to the undersigned, 620 University Avenue, Toronto 2, Ontario, and clearly marked

"TENDER FOR ST. LAWRENCE POWER PROJECT CANADIAN NATIONAL RAILWAYS RELOCATION SUPPLY AND ERECTION OF STEEL RAILWAY BRIDGES"

will be received up to 4:30 p.m. Eastern Standard Time on

TUESDAY, NOVEMBER 29, 1955

for the supply of material, fabrication, transportation, erection, and painting of one or more of three steel railway bridges required for the relocation of the Canadian National Railways, St. Lawrence Power Project. Total estimated weight 230 tons. Delivery of the materials to the nearest railroad siding is required May 1, 1956, and erection is to be completed June 1, 1956.

Copies of the tendering documents may be obtained on or after Wednesday, November 9, 1955, at the office of the Director of Supply, 620 University Avenue, Toronto 2, Ontario, on payment of $25.00 for each set. This charge will not be refundable.

Tendering documents may be inspected at the above address and at the offices of the following: The Commission's Field Office, Cornwall, Ontario; Power Authority of the State of New York, 270 Broadway, New York 7, New York; and Uhl, Hall & Rich, 230 Congress Street, Boston 10, Massachusetts.

Tenders must be accompanied by a certified cheque drawn on a Canadian chartered bank for the sum of Four Thousand Dollars ($4,000) for each of two bridges and Two Thousand Dollars ($2,000) for the third bridge. Provisions for the return of the cheques appear in the tendering documents. The successful tenderer will be required to furnish a performance bond in the form approved by the Commission and issued by a bonding company licensed as such in the Province of Ontario and acceptable to the Commission for one hundred per cent (100%) of the total amount of the contract. The lowest or any tender will not necessarily be accepted.

E. B. EASSON
SECRETARY

OFFICIAL PROPOSALS

Bids: December 23, 1955

Larson Air Force Base, Washington

ADVERTISEMENT FOR BIDS
BOEING AIRPLANE COMPANY
MOSES LAKE FLIGHT CENTER

Sealed bids are hereby invited for the construction of an eight-place hangar, including earthwork, paving, utilities and miscellaneous items of work at Moses Lake Flight Center, Larson Air Force Base, Grant County, Washington, for the Boeing Airplane Company, Seattle Division.

The work includes but is not limited to the following:

(1) 8-place hangar structure, complete.
(2) Excavation, fill, grading and subgrade preparation.
(3) Concrete hangar apron and yard paving.
(4) Asphaltic concrete parking area, road, and fire lanes.
(5) Drainage; storm and sanitary.
(6) Fire protection reservoir.
(7) Domestic and fire protection water lines.
(8) Air piping from existing Service Building.
(9) Steam generating unit and accessory work in existing Service Building and steam supply and return lines for the hangar.
(10) Electrical distribution and communications systems.
(11) Modifications to existing Service Building.
(12) Oxygen storage facility.
(13) Underground gasoline storage tank at existing Oil Storage Building.
(14) Blast fence.
(15) Gun Firing Facility.
(16) Runway Threshold Lighting.
(17) Taxiway Revisions.

This contract will constitute a sub-contract under a prime contract between Boeing Airplane Company and the United States Government.

Bid, Performance and Payment bonds will be required.

Not more than three (3) sets of contract documents may be obtained by each general contractor bidder, whether a single firm of joint venture on or about November 22, 1955. Subcontractors may obtain one (1) set only of complete documents or one (1) set only of partial documents preassembled for certain major sub-contract phases of the work. A deposit of one hundred dollars ($100.00) in the form of a certified check will be required on each complete or partial set upon application at the offices of Naramore, Bain, Brady and Johanson, Architects and Engineers, 904 Seventh Avenue, Seattle 4, Washington. Deposits will be refunded upon return of document sets in good condition to the offices of the Architect-Engineer within two (2) weeks following opening of bids.

Complete sets of bid documents will be available for inspection by prospective bidders at the following locations:

Naramore, Bain, Brady & Johanson, 904 Seventh Avenue, Seattle 4, Washington.
Naramore, Bain, Brady & Johanson, Moses Lake Flight Center, Moses Lake, Washington.
Associated General Contractors of America, 215 W. Harrison, Seattle, Washington.
Plan Bureau, 2413 Western Avenue, Seattle, Washington.
Mountain Pacific Chapter of Associated General Contractors, Benjamin Franklin Hotel, Seattle, Washington.
Associated General Contractors of America, 452 St. Helens, Tacoma, Washington.
Construction Council, Spokane Hotel, Spokane, Washington.
Associated General Contractors of America, Eastern Washington Builders' Chapter, 1207 N. Washington, Spokane, Washington.
Associated General Contractors of America, So. 102 Stevens, Spokane, Washington.
Builders' Exchange, Builders Exchange Building, Portland, Oregon.
Associated General Contractors—Central & Northern California, 850 Battery, San Francisco, California.
Southwest Builders & Contractors, 1660 Beverly Blvd., Los Angeles, California.
F. W. Dodge Corporation, Thomas Building, Dallas, Texas.
F. W. Dodge Corporation, 700 Merchandise Mart, Chicago, Illinois.
Builders' Exchange, National Building, Minneapolis, Minnesota.
Wenatchee Construction Council, Wenatchee, Washington.
Columbia Basin Construction Council, Inc., 606 W. 3rd, Moses Lake, Washington.
Associated General Contractors of America, 2103 Crawford, Houston, Texas.

Sealed bids will be opened and publicly read at 2:00 P.M., P.S.T., December 23, 1955 in the Engineering Building, Boeing Airplane Company, Seattle, Washington.

EMPLOYMENT OPPORTUNITIES

NATIONAL COVERAGE

RATES

DISPLAYED: The advertising rate is $24.25 per inch for all advertising appearing on other than a contract basis. An Advertising inch is measured 7/8" vertically on a column—3 columns—30 inches to a page. Subject to Agency Commission.

UNDISPLAYED: $1.80 per line, minimum 3 lines. Box Numbers—counts as 1 line. Discount of 10% if full payment is made in advance for 4 consecutive insertions. Not subject to Agency Commission.

Send NEW ADS to ENGINEERING NEWS-RECORD, 330 W. 42nd St., N. Y. 36, N. Y., for December 8th issue closing November 28th

civil estimator

Large New York engineering and construction firm has staff opening for Chief Civil Estimator. Should be graduate civil engineer with experience in power plant field. Particularly interested in a man with field engineering or construction supervisory experience on hydroelectric developments. Should be capable of heading up civil estimating group. Excellent opportunity for qualified man. Please submit resume of education, experience and personal data.

P-8219, Enginering News-Record
330 W. 42 St., New York 36, N. Y.

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INCLUDE EDUCATION, EXPERIENCE, REFERENCES AND SALARY EXPECTED IN APPLICATION LETTER

Howard, Needles, Tammen & Bergendoff
55 Liberty St. New York 5, N. Y.

DESIGN ENGINEERS
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HIGHWAYS AND BRIDGES

WATER AND SEWAGE TREATMENT
ALSO
DETAILERS AND DRAFTSMEN

Permanent positions with unique benefits for sincere ambitious men—submit educational background, experience record, salary requirements and availability.

GLACE & GLACE, INC.
Consulting Engineers
1001 North Front Street Harrisburg, Penn.

SALES MANAGER

One of the oldest wood preserving firms is seeking a Sales Manager to direct an expanding sales program for Creosoted Wood Products. Sales activity will include the expanding of existing sales force directing the enlarged force, opening new territories, determining new uses for products. This company at present has extensive sales and a large volume of business through five wood preserving plants. Experience in selling Creosoted Wood Products is most desirable, although not essential, but previous sales management in the building construction materials field is required.

Age requirement is open but the desired range is over thirty years and under forty-five years.

Salary is to be negotiated depending upon experience, capability, aggressiveness, and related qualifications.

SW-8444, Engineering News-Record
520 No. Michigan Ave., Chicago 11, Ill.

INSTRUMENT MAN WANTED

Preferably civil engineering graduate with several years field experience by large heavy construction contractor. Permanent position, location Maryland. Excellent opportunity for ambitious man as several of our executives have started with us in similar positions. Please state age, education, short experience outline, and salary wanted.

P-8365, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ESTIMATORS

Experienced in Process Equipment and piping costs, for Chemical Plant & refinery construction. Position offers good future with progressive Penna. firm. Send resume to

T-95, P. O. BOX 3495
Philadelphia 22, Pa.

Fire Protection ENGINEERING

An expanding field with a top-flight organization.

RECENT GRADUATES

Wanted to train as fieldmen. Send personal resume to:

P-8418, Engineering News-Record
330 W. 42nd Street, New York 36, N. Y.

WANTED

STEEL SHEET PILING SALES REPRESENTATIVE

for following territories. 1. Ohio, 2. Michigan, 3. Virginia, 4. North Carolina, 5. South Carolina, 6. Alabama, 7. Tenn., 8. Kentucky.

P-8304, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

Assistant City Engineer for Wisconsin City with 15,000 population. Registration as professional engineer in Wisconsin is desirable as appointment as City Engineer may be possible upon retirement of present City Engineer. In first letter, state age, experience, and salary expected. P-8135, Engineering News-Record.

Designers for toll roads and bridges. Experienced and inexperienced men with a civil engineering degree wanted (for a period of about 24 months) in the office of a well known organization in central Pennsylvania. State qualifications, age, salary requirements and availability in first letter. P-8158, Engineering News-Record.

Assistant City Engineer for general municipal work. Send personal data. Salary range $4450-$4930 plus benefits. City Engineer, Watertown, New York.

Graduate Civil engineer with extensive experience and proven ability to serve as project manager for American contractor in South America. Work involves construction of portable water supply system. Contract one year with option of renewal. Submit resume, age, education, experience, references, present salary requirements and availability. Write P. O. Box 51, Panama, R. P.

Registered Architect, for association in Alaska. Potential $12000 plus send resume airmail to Philleo Engineering Service, Box 464, Fairbanks, Alaska.

Engineering Graduate with concrete paving experience for technical and promotional field work in Eastern Pennsylvania. Permanent. Old-established national organization. Reply should include summary of experience and salary requirements. P-8281, Engineering News-Record.

Instrument Men—West Indies surveys, plot layout, some development planning send resume, recent photo and salary requirements. P-8209, Engineering News-Record.

Electrical Engineer — As assistant superintendent for Midwest Municipal Electric and Water Utility. Experience in design, planning and operation of 2400/4160 volt distribution systems. Knowledge and experience in steam generation plants desirable. Excellent opportunity for advancement. Age 32-45. P-8214, Engineering News-Record.

Structural concrete superintendent for a general contractor doing work in New York State. Must have experience in reinforced concrete grade separation work and following in the trades. State experience and salary desired. Reply to P-8305, Engineering News-Record.

Engineers experienced in water and sewage works projects or related fields. Opportunity for permanent connection with long established consulting firm. Please state full qualifications, experience, references and salary requirements. Location Ohio. P-8294, Engineering News-Record.

Wanted—Young man with technical experience preferably in mining or quarrying. One interested in the field of commercial explosives, their development and sales. Position permanent with excellent opportunity for advancement. Interview arranged on basis of letter stating qualifications and salary desired. P-8296, Engineering News-Record.

Draftsmen, experienced structural steel detailers on all types of buildings and conveyor work. Long range program, good working conditions in a consulting engineer's office, paid holidays and vacation plan. Send complete information to: Samborn, Steketee & Associates, 1214 Cherry Street, Toledo 4, Ohio.

Civil Engineers—one resident engineer on large sewerage project. One designer experienced in water and sewerage design. Give full particulars, salary desired, and availability. Location Central Illinois. P-8427, Engineering News-Record.

(Continued on page 154)

ELECTRICAL ENGINEER

Experience or background desirable in power transmission, electronic controls, motors, and generators. Position includes design and layout work, preparation of project specifications and field coordination.

This permanent position offers excellent future with Virginia's newest Fiber Plant located off Route 10, one mile north of Hopewell.

NATIONAL ANILINE DIVISION

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CHESTERFIELD PLANT

HIGHWAY ENGINEERS

OVERSEAS AND DOMESTIC

Applications now being accepted for a limited number of additional openings.

Foreign project located near Bangkok, Thailand requires qualified field engineers and location surveyors with extensive highway experience as construction inspectors, party chiefs or instrumentmen; ages 28 to 45, degree or college background. Bachelor status only; excellent salaries and allowances; free food and lodging.

Openings for draftsmen and junior design engineers in our St. Louis office require young men, preferably with degrees, with one or two years experience. Positions available now offer excellent opportunities for the future.

Field men with highway location experience are invited to inquire regarding openings on survey parties for midwest projects.

Top salaries commensurate with education and experience, plus employee benefit and retirement plan, paid vacations; sick leave and paid holidays. Write for application form.

SVERDRUP & PARCEL ENGINEERING COMPANY

1134 Locust Street — St. Louis 1, Mo.

GRAVEL QUARRY CONSULTANT

We are looking for a man that has a wide experience in the sand, gravel and quarry business. You can be any age—You can be a factory representative or a producer. We want you to act as a consultant to our salesmen. We represent Iowa Manufacturing Co., Northwest Engineering, Ingersoll-Rand and many other lines complementary to the gravel and quarry business. Our headquarters are in Indianapolis.

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Challenging opportunities for Party Chiefs and Instrumentmen experienced in map survey control. Experience with aerial photographs and theodolites desirable. Permanent positions; considerable travel necessary. Forward detailed resume and salary desired.

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Knowledge of Foreign language necessary in some classifications.

Write, giving full particulars concerning education, experience, personal history and availability to:

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Baker Building — Rochester, Penna.

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Must have degree or equivalent plus 6-10 years experience.

P-8255, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

PLATE DESIGNER and ESTIMATOR

Graduate Engineer, Civil or Mechanical with several years experience. We fabricate all types of tanks, stacks and breeching. Work location in large Southern city.

Permanent employment, liberal company benefits, salary commensurate with experience. Write fully in confidence stating experience, education and salary requirements to:

P-8166, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

POSITIONS VACANT

Dredge Superintendents and Field Engineers wanted with experience in hydraulic pipeline dredge field (16 to 30 inches). Jobs open are permanent, covering both domestic and foreign operation. Compensation is attractive and lack of formal training or an engineering degree need not rule out a candidate if compensated by practical experience. Founded in 1898 and a leader in the fields of hydraulic dredging, waterways engineering and seismic surveys, we are forced by expansion of business to expand our organization. Reply by letter giving enough details to warrant arranging a personal interview. Replies held strictly confidential. Address E. K. Sandbach, Vice President, Gahagan Construction Corporation, 90 Broad St., New York 4, N. Y.

Municipal Engineer Wanted. The Borough of Madison, New Jersey is seeking applicants for the position of borough engineer. Basic requirements are: New Jersey Professional Engineer's License; Degree in Civil Engineering with courses in electrical engineering and hydraulics or equivalent; 10 years of practical engineering experience, preferably in Municipal work. We are looking for an executive-type man capable of administering and supervising all of the Borough's Engineering, Public Works, Electric and Water Utilities. Madison is a high class all-residential suburban community of approximately 14,000 population located in the metropolitan New York area. Interested persons meeting the requirements should apply in writing stating qualifications, experience, references, age and other personal history. Arrangements can be made for personal interview. All communications should be addressed to: Councilman R. D. Knapp, 4 Redmond Drive, Madison, N. J.

Technical Sales Representatives: Nationally known organization rated AAA-1, manufacturing reinforced Polyester sheet, plate and shapes, seeks responsible individuals or firm to fit in with national distribution plan. Replies must state background and experience. All replies kept in strict confidence. P-8424, Engineering News-Record.

Assistant Plant Maintenance Supervisor, Water Department. Requirements, equivalent to degree in mechanical or electrical engineering. Four years of experience in plant construction, maintenance, and repair. Salary range: $372 to $494 per month. Civil Service Department, Room 412, City Hall, Dallas, Texas.

Wanted: Bridge & Highway designers with office and field experience by consulting engineering firm in Pennsylvania. Give complete details and salary desired. P-8381, Engineering News-Record.

Man Wanted to estimate and promote structural steel building specialty; engineering background preferred, tho not essential. P-8377, Engineering News-Record.

Assistant Water and Sewage Pumping Supervisor. Requirements: equivalent to degree in electrical or mechanical engineering. Two years of experience in water and sewage pumping operations and maintenance. Salary range: $402 to $533 per month. Civil Service Department, Room 412, City Hall, Dallas, Texas.

Superintendent, heavy construction, top notch man, thoroughly familiar earth moving equipment and underground utilities with active developer 1-family houses in N. J. Permanent connection. P-8407, Engineering News-Record.

Construction superintendents with active developer 1-family houses in N. J. Top notch men only. Must be thoroughly familiar all trades from start to finish. Permanent connections. P-8411, Engineering News-Record.

Architectural draftsman for school and church buildings. Must be capable of doing structural steel designs. Need experienced man qualified to take responsibility. Write P. O. Box 278, Lancaster, Ohio, giving qualifications, experience and salary or phone Lancaster 2243-W for appointment.

Wanted: Tunnel superintendent and shifters experienced in both heavy earth and rock tunnels. Location: Colorado and Pennsylvania. State age, experience and salary desired. P-8341, Engineering News-Record.

City Engineer, graduate civil engineer to serve as administrator of public works and building dept. in village of approx. 8,500. Must be capable of preparing engineering surveys and studies for public improvements. Ill. registration or eligibility required. Salary $6000 to $7000. Please send detailed resume to President, Board of Trustees, Libertyville, Ill.

Highway Designers, Bridge Designers, draftsmen. Permanent positions available. Location Southern Connecticut. Send complete experience record, references and salary desider. P-8438, Engineering News-Record.

POSITIONS VACANT

Civil Engineer with extensive structural background. Permanent position with large volume San Francisco-East Bay home builder. Experience in the proper engineering of partial prefabrication and efficient methods of organization and construction. Salary open. Please give full particulars in first letter. P-8358, Engineering News-Record.

Electrical contractor, construction, foreign air base project—lines, buildings and utilities. P-8347, Engineering News-Record.

Office Manager (Male or Female) or administrative assistant, for small, growing manufacturer in urban North Jersey. Bookkeeping experience essential. Construction or Civil Engineering background desirable. P-8439, Engineering News-Record.

SELLING OPPORTUNITIES OFFERED

Wanted: Mfrs. representative, interested in asphalt and tar specialties to represent N. J. Co. in N. Y., Pa., Conn., R. I., No. & So. Car., Delaware. RW-8440, Engineering News-Record.

Looking for an aggressive sales representative or salesman for wholesale portland cement selling. Will be required to travel & contact large wholesalers, construction contractors etc. Must have at least 5 yrs. wholesale experience in cement line. SW-8441, Engineering News-Record.

POSITIONS WANTED

Mechanical Engineer 25 years broad experience design of steam-electric power, iron and steel, chemical and other heavy industrial process plants. Fully capable supervising design of complete plants; specifications, estimates, and economic reports. Specialist in high pressure and temperature piping design. PW-8084, Engineering News-Record.

Construction Sup't. over 20 years experience, industrial and high class finished projects. Engineer. Anywhere. Salary $200. PW-8252, Engineering News-Record.

Construction Supervisor — Civil Engineer BSCE 5 years experience in soils, asphalt and concrete. Airfields, rails and highways. Desire foreign work. Go anywhere. Resume on request. Available 15 December. PW-8251, Engineering News-Record.

Construction Superintendent—now completing multi-million dollar S. American assignment, 20 years diversified background, excavation, tunnels, irrigation structures, dams, power plants, pump plants, heavy building, foundations, machinery installation, planning, layout, cost. Age 43, tri-lingual. Salary or % interviews East or West coast. Available Feb, '56, highest references. PW-8329, Engineering News-Record.

Construction Executive, thoroughly experienced industrial, commercial construction; all phases building industry: estimating, buying, field management. PW-8273, Engineering News-Record.

Supt. Heavy Const. blasting, open cuts, shafts, tunnel quarry, coral rock. Earth moving and concrete. PW-8380, Engineering News-Record.

Civil Engineer—Registered, College graduate, estimator, field supt., former pilot, 9 yrs. exp. building constr.; highway survey, desires to relocate Jan. 1st. Sal. range $9,000 to $11,000. Reply PW-8372, Engineering News-Record.

Highway and traffic engineer desires connection with firm doing turnpike work. Prefer a Midwest location. PW-8375, Engineering News-Record.

Superintendent or Engineer—registered P. E. in New Jersey. Experienced in estimating & construction of building construction, piling, pipeline, bridges, and general engineering type construction. Desire position in N. J. PW-8336, Engineering News-Record.

Party Chief or Assistant Supt—heavy const. Available immediately for N. J., N. Y., or Conn. area. PW-8337, Engineering News-Record.

Construction Field Engineer, B.S.C.E. Degree, age 32, last 3 years field experience in heavy construction. Other experiences include office procedure, drafting, and surveying. Prefer Northeast. Resume on request. PW-8430, Engineering News-Record.

Industrial Construction Manager. Civil Engr., exper. multi-project supervision. Job-planning & cost-control specialist. 6430 Lemon Ave., Long Beach 5, Calif.

C. E., Genl. superintendent, 22 years experience heavy construction, German graduate, 5 languages, 2 yrs. USA back from S. A. seeks relocation USA or Foreign. PW-8368, Engineering News-Record.

Engineer-Executive, 24 years experience 14 years supervisory capacity. Specialties. Plant design and materials handling. Middle West location preferred. PW-8357, Engineering News-Record.

REFINERY ENGINEERS

CALTEX has openings for Engineers in the following fields:

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- Refinery Construction Engineering

Candidates should meet the following requirements:

- Bachelor's or Master's Degree in Chemical, Mechanical or Civil Engineering from a recognized college or university.
- 3 or more years' experience in any of the above-listed fields.
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- Interest in possibility of future overseas service.

Salary commensurate with background and experience. Liberal employee benefits.

Send detailed resume to:

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APPLICABLE TO DESIGN OF INDUSTRIAL FACILITIES, TEST FACILITIES, POWER PLANTS AND ELECTRICAL INSTALLATIONS.

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We desire engineers who want long range employment with ample opportunity for professional development and advancement. Employee Benefits Plan plus other attractive features.

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Consulting Engineers
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Applicants should have at least five years' of experience.

Here is a rare opportunity for you to utilize your engineering abilities and talents.

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Mild Climate!

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ASPHALT PLANT INSPECTOR

LABORATORY TECHNICIAN

SOILS ENGINEER

Send full resume—confidential—including salary desired—to:

P-8374—Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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Having experience with heavy material handling equipment

Permanent Position For Qualified Men

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(Structural)

Degree and responsible experience of at least three years in structural steel, and reinforced concrete on bridges, building, or heavy structures.

Send complete resume and salary requirements to

P-8406, Engineering News-Record
330 W. 42nd St., New York 36, N. Y.

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WILSON *Engineering Corp*
College House Offices HARVARD SQ. CAMBRIDGE, MASS.

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Needed by May, 1956 or earlier, in new or used—excellent condition.

2 Electric Gantries, 80 tons at 40' radius, 440 V, 3 ph. 60 C.

8 Dock winches, 40,000-lb. line pull 30 FPM, motor operated, 440V, 3 ph. 60 C.

8 Deep well pumps, lift 70' at 30 psi and 70' at 100 psi.

2 Pumps, approx. 60,000 GPM, 2300 V, 3 ph. 60 C, 50' head.

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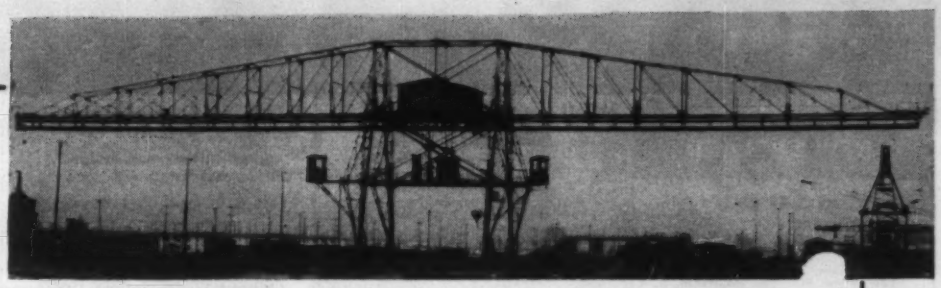

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Golden Anderson Valve Co.....80
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Griffin Wellpoint Corp.....142
Gulf Oil Corp.....103
Gunite Const. Corp.....141

Hamilton Rubber Mfg. Corp.....141
Hartford Fire Ins. Co.....44
Hartford Accident & Indemnity Co.....44
Hendrix Mfg. Co., Inc.....14
Hercules Motors Corp.....78
Hercules Powder Co.....39

Ingersoll Rand Co.....135
International Steel Co.....68
International Bartering Co.....142
Irvington Form & Tank Corp.....37

Jaeger Machine Co.....140
Johnson, C. S.....63

Kinnear Mfg. Co.....102
Koehring Co., The.....62, 63
Kwik-Mix.....63

Layne & Bowler Pump Co.....12
LeRoi Co.....143
LeTourneau-Westinghouse Co.....121, 123, 125, 127
Levinson Steel Co.....99
Lock Joint Pipe Co.....16
Longyear Co.....147
Lufkin Rule Co.....126
Lukens Steel Co.....42

Madsen Iron Works, Inc.....126
Mahon Co., R. C.....18
Manu-Mine Research & Dev. Co.....94
Mayo Tunnel & Mine Equip. Co.....163
McGraw-Hill Co.....114, 115
McKiernan-Terry Corp.....122
Merritt-Chapman & Scott Corp.....6

National Gypsum Co.....45, 128
Naylor Pipe Co.....70

Oliver Corp.....2nd Cover
Orton Crane & Shovel Co.....98
Owen Bucket Co.....8
Owens Corning Fiberglas Corp. (Industrial).....7

Parsons.....63
Peerless Pump Div. of Food Machy. Corp.....113
Pittsburgh-Des Moines Steel Co.....92

Raymond Concr. Pile Co.....10, 11
Reflectal Corp. Div. Borg Warner Corp.....129
Remington Arms Co., Inc.....77
Republic Steel Corp.....90, 91
Richmond Screw Anchor Co., Inc.....87
Roebling's Sons Corp., John A.....109
Rogers Bros. Corp.....101

St. Paul & Tacoma Lumber Co.....137
Smith Engr. Wks.....13
Sonoco Prod. Co.....118, 119
Sprague & Henwood, Inc.....141
Standard Steel Spring Div., Rockwell Spring & Axle Co.....124
Stang Corp., John W.....116
Superior Concr. Accessories.....89

Thew Shovel Co., The.....15
Timber Engr. Co.....96
Timber Structures, Inc.....134
Truck Mixer Mfr. Bureau.....100
Turner-Halsey Co.....57
Twin Disc Clutch Co.....85

Union Metal Mfg. Co.....97
U. S. Pipe & Foundry Co.....3
U. S. Steel Corp.....138, 139
United Steel Fabricators, Inc.....88
Universal Form Clamp Co.....74

Viber Co.....120
Visking Corp.....133

Waukesha Motor Co.....84
Westinghouse Electric Corp.....71, 72, 73
Wickwire Spencer Steel Div., Colorado Fuel & Iron Corp. (Insert).....65
Wood Co., R. D.....132

Professional Services.....160-162

CLASSIFIED ADVERTISING
F. J. Eberle, Ass't Mgr.

Employment Opportunities..152-155
Educational.....155
Proposals.....149-152
Equipment (For Rent, Sales Wanted)...156-159

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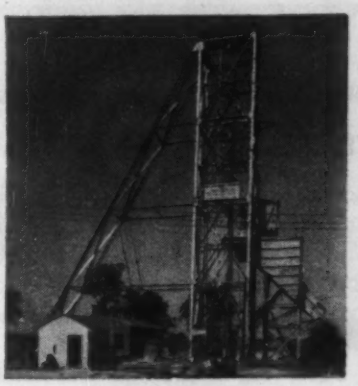

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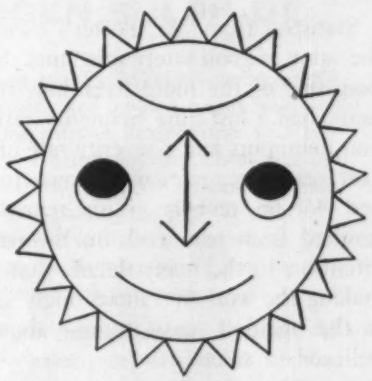

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EDITORIALS

The Boss Must Believe in Safety

ACCIDENT PREVENTION HAS MADE GREAT STRIDES on construction, paying off in humanitarian values, improved efficiency and in cold cash realized from savings in compensation insurance rates. Yet despite these advantages there are still contractors whose apathetic treatment of job safety borders on neglect.

Each year at the National Safety Congress, serious-minded and practical construction men seek new ways to combat this apathy. Last month's meeting was no exception, and one of the most promising answers was given new emphasis by Alan A. Porter, vice president of erection of U. S. Steel's American Bridge Division. Responsibility for construction safety, he said, rests squarely on the shoulders of those in the top echelons of management. It is they who have the duty to see that basic policies implementing safety are properly formulated. And it is they who must imbue the entire organization with the feeling that these policies are firmly believed in by management.

Once such an atmosphere has been created it then becomes a question of teamwork, in which the whole management team—the chairman of the board, president, vice presidents, project managers, engineers, superintendents and foremen—must cooperate to the utmost. Let one segment or even one individual in management's line of responsibility ignore or refuse to be bothered with accident prevention, and an outfit can pile up a needless number of costly accidents in short order.

Statistics from Mr. Porter's own industry point up the value of good safety programs. Structural steel erection, one of the more hazardous construction occupations, had a lost-time frequency rating of 82.7 per million manhours and a severity rate of 17.4 ten years ago. Last year these rates were down to 25.9 on frequency and 4.9 on severity. This remarkable improvement resulted from teamwork on the part of management, attention to the many details that improve safety and making the workmen increasingly safety-conscious. But in the broadest sense it came about because the boss believed in safety.

Engineers and Technicians

A TASK COMMITTEE HAS REPORTED to the Surveying and Mapping Division of ASCE on the status of surveying and mapping. The meat of its report is a complete classification of positions within the field into two lists: (1) professional level and (2) pre-professional or technician level. The fact that such a classification of positions could be accomplished within one division of ASCE leads to interesting speculation on what might be the results if each division of the Society distinguished the professional level from the pre-professional or technician level for all positions filled by its members.

Such an up-to-date break-down could be most illuminating. It might show, for instance, that a great many graduate engineers are in work considered below the professional level—and that they remain in pre-professional positions for longer than reason would warrant. It might show all too few capable technicians trained expressly and solely for positions within civil engineering at the technician level. It might show whether the published overall ratio of one technician to 2.5 engineers holds true for civil engineering—and might indicate that this ratio should be something quite different. It might shed needed light for the proposed thorough study of engineering education being planned by ASCE.

In total, such a classification of positions within all of civil engineering could perhaps reshape entirely present thinking on engineer shortages and engineer shortcomings. At least, it makes interesting speculation.

Highway Prospects Brighter

THE DEFEAT of the New York State highway bond financing proposal in the recent election is no criterion of voter attitude on highway spending. It stemmed wholly from local issues bound up with a controversy over whether there should be an anti-diversion amendment to the state constitution. On a national scale the following statement is much more significant: "Neither political party will want to enter the 1956 campaign without having authorized a highway bill." Credited to Senator Walter F. George, it sums up a change in thinking among members of Congress that is in sharp contrast to the indifference of the early part of this year when the Eisenhower Administration was trying to get its highway program approved.

While Senator George still sees disagreement on how to finance a new highway program, which he visualizes as requiring from $18 to $20 billion in federal money over a period of years, his statement suggests that a way will be found. Also looking ahead to 1956, Secretary of Commerce Sinclair Weeks sees the Administration willing to make reasonable concessions on financing in order to get its big highway program authorized by Congress. The first business the President transacted at his new Gettysburg office this week was a discussion of the highway program with Secretary Weeks.

That, too, is a hopeful sign, because it was the Administration's proposal to finance a large part of that program by a bond issue that produced most of the opposition to its "Grand Plan." The reasonable concessions, Secretary Weeks said, would include agreement to a pay-as-you-go program based on equitable taxes on highway users.

If all interested parties approach the coming discussions of a new federal-aid highway program in that spirit, shaping up a widely acceptable program should not be too difficult.

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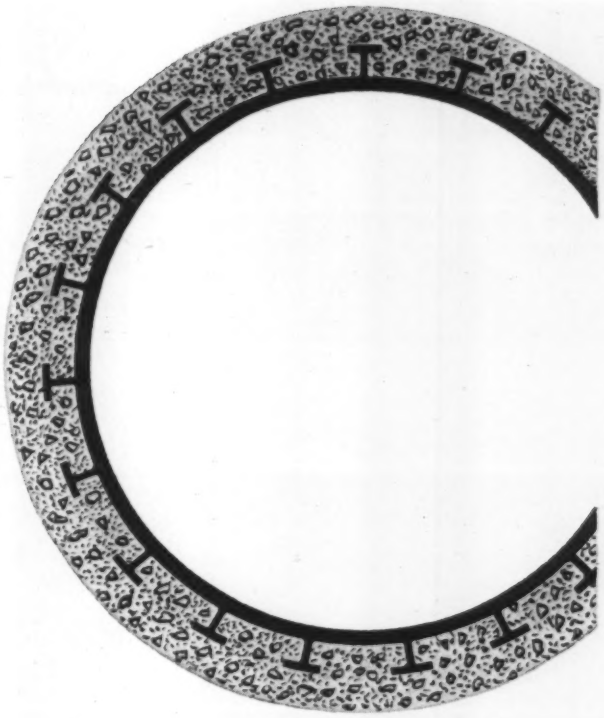

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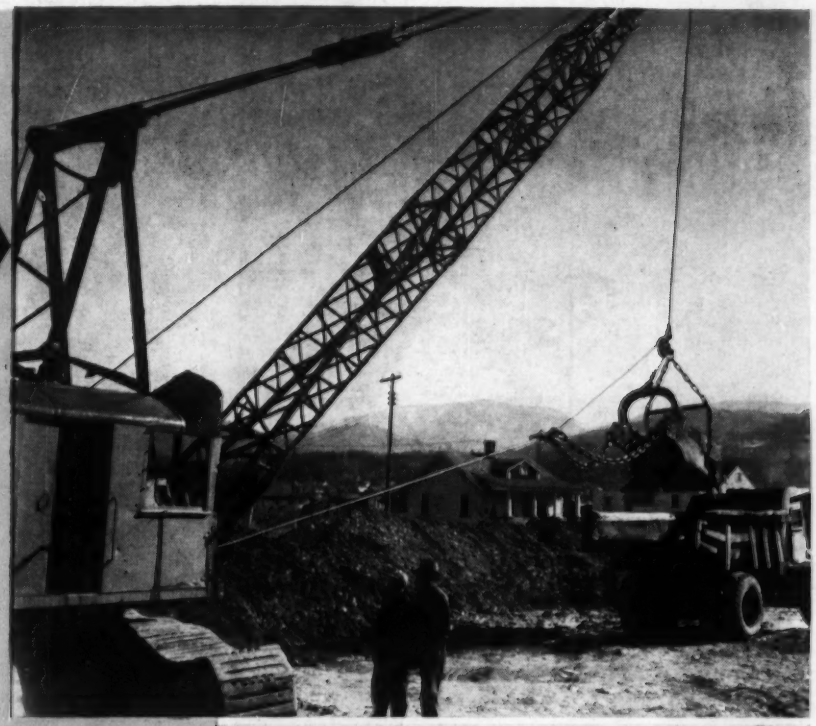

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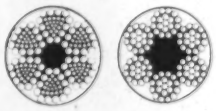

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